

FLIGHT

The
AIRCRAFT
ENGINEER
AND
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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Flight

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CONTENTS

	PAGE
Editorial Comment	
"Our Future is in the Air"	1439
The Hun in the Air	1440
The R.A.F. as a Separate Service	1440
The Flying Services Fund	1442
Flight—and the Men: Sir Napier Shaw	1441
The Camera and the Plane	1443
The Flight to Australia	1444
Royal Aero Club: Official Notices	1450
The Bristol "Tourer"	1452
Airships	1453
Airisms	1457
In Parliament	1460
The Royal Air Force	1461
Company Doings	1464

DIARY OF FORTHCOMING EVENTS.

Club Secretaries and others desirous of announcing the date of important fixtures are invited to send particulars for inclusion in the following list:

Nov.	Entrance Examination for R.A.F. College.
Nov. 7-15 ..	Olympia Motor Car Show.
Nov. 12	"Some Physical and Psychological Effects of Altitude." Lecture by Dr. Chas. Atkin Swan before R.Ae.S.
Dec. 3	"The Air Force." Lecture by Air-Commodore H. R. Brooke-Popham before R.U.S.I.
Dec. 19 to ...	Paris Aero Show.
Jan. 4, 1920.	
July, 1920	S.B.A.C. International Aero Exhibition at Olympia

EDITORIAL COMMENT

Another column we publish certain extracts from the articles in the *Evening Standard*, written by Sir Percy Scott, which caused so much sensation a week or so ago. With those parts of Sir Percy's revelations relating to the neglect of gunnery in the Navy, and to our general want of naval preparedness at the outbreak of war, we have nothing to do here. They will doubtless be judged by history, if not now, and we can pass them by with the expression of opinion that if they are true—and we cannot doubt that they are—then the whole administrative system of the Royal Navy is utterly hopeless, and must be swept away, to give place to an organisation

which knows its duty and will do it. During the War more than one highly-placed Naval officer was removed from his command for real or alleged incompetence, yet none of the Admiralty staff who were responsible for allowing us to go into the War with naval equipment far and away inferior to that possessed by the enemy has suffered in any way—except that some have been given the O.B.E.!

What we are very much concerned with are Sir Percy's views of the future and value of naval aviation. It is clear that in his opinion we are wasting money and deluding ourselves into a sense of false security by the building of capital ships costing anything up to eight millions a-piece. In this view he is in goodly company. Lord Fisher, in a letter to *The Times*, says: "It is as clear as daylight that future war at sea precludes the use of any vessel of war that can't go under water, because aircraft will compel it All you want is the present naval side of the Air Force—that's the future navy."

Now, here are two exceedingly eminent naval officers whose opinions coincide absolutely in the matter of future naval war. Lord Fisher is the one whose far-sighted brain grasped the certainties of the future, and, in face of the strongest opposition, succeeded in re-grouping the Fleet against the German menace. If others had had their way, the Navy would have been distributed as it was twenty years ago, and Germany's "chosen moment" would have resulted in a blow at our vitals from which it is more than possible we could not have recovered in time. It was he who anticipated the trend of design of the capital ship and got in first with the "Dreadnought" type of battleship, and thus gave us a two-years' lead of Germany in ship construction. Sir Percy Scott was the father of scientific gunnery in the Navy. It was he who was the first to realise that naval war was destined to undergo a complete change in character, and that the motto of the battle-winning fleet must be: "Gunnery, more gunnery and yet again gunnery." Invariably the ships he commanded headed the gunnery lists of the Navy. He introduced new methods of fire-control and gun-laying—methods which, as he has recorded, the hide-bound officials of the Admiralty would not adopt. It was he who was responsible for director firing, which has now been adopted by all the first-class fleets of the world.

It is worth while glancing thus briefly at the records of these two distinguished officers, because by so doing we are able to see that all their success

has been the result of ability to assess the future. In all their prognostications of development it is possible to say that neither has been demonstrated to be wrong. Why, therefore, should they not be equally correct in their prophecies about the influence of aircraft on the naval wars of the future? Obviously, there is no reason at all. Yet in face of such opinions—which we cannot think are solely held by Lord Fisher and Sir Percy Scott—we are spending blindly and without enquiry large sums on the building of ships like the *Hood*—said to be costing about £8,000,000—which can be put out of action in an hour by aircraft and submarine attack. At the same time, we are scrapping as fast as we can the whole of the complex organisation of aerial defence built up during the War, and are putting nothing in its place. The airships are being sold to private concerns. The coastal seaplane stations are being closed down wholesale. Even the aeroplane establishment for working afloat with the Navy has been drastically reduced. Yet Lord Fisher and Sir Percy Scott tell us that air-power in the future is sea-power—and no-one in authority heeds them. We are not even taking the first steps to build up that adequate Flying Reserve of which we have written more than once.

It may be, of course, that both of these distinguished sailors are wrong. Doubtless, the Board of Admiralty will in due time assure the country that they are. But, surely, the right thing to be done is to enquire exhaustively and impartially into the tenability of the hypotheses they advance, and if it is held that they have allowed enthusiasm to run away with judgment—we do not think they have, but that is another matter—the country should be told so and why. We have had enough of the methods of red-tape, which sent our Fleet to fight the battle of Jutland without proper means of fire control, with guns that were outranged by those of the enemy, with shell that would not penetrate the armour of the German ships, and with searchlights hopelessly inferior to those of the Huns. These matters must no longer be left to be the playthings of permanent officials and of admirals who, while they may have done gallant service in the past, are a part of what is undoubtedly, so far as the senior ranks are concerned, the most conservative service in the world. We must have vision and breadth of outlook in these matters. We have never had these in the past and we have paid an enormous price in blood and treasure for our shortcomings. Let those in authority take heed to the warning.

The Hun in the Air

Considerable alarm is being manifested in France at the belief that Germany is organising an elaborate and efficient system of commercial air transport, capable of being transformed at a moment's notice into a formidable weapon of war. The facts on which the apprehension is based seem to be that Germany is organising a complete network of commercial air routes, radiating from Berlin to numerous points on the frontier, and linking up all the chief ports. At the present stage of the development of flying such organisations can only be maintained by State subsidies, the aim of which in this case is clear. Then, it is estimated that Germany at the present moment owns no fewer than 20,000 aeroplanes, a number which would prove intensive manufacturing activity since the Armistice. An Airmen's Union has been formed, the effect of which will be to keep

German aviators combined in an organisation admirably constituted for their instant mobilisation in case of war.

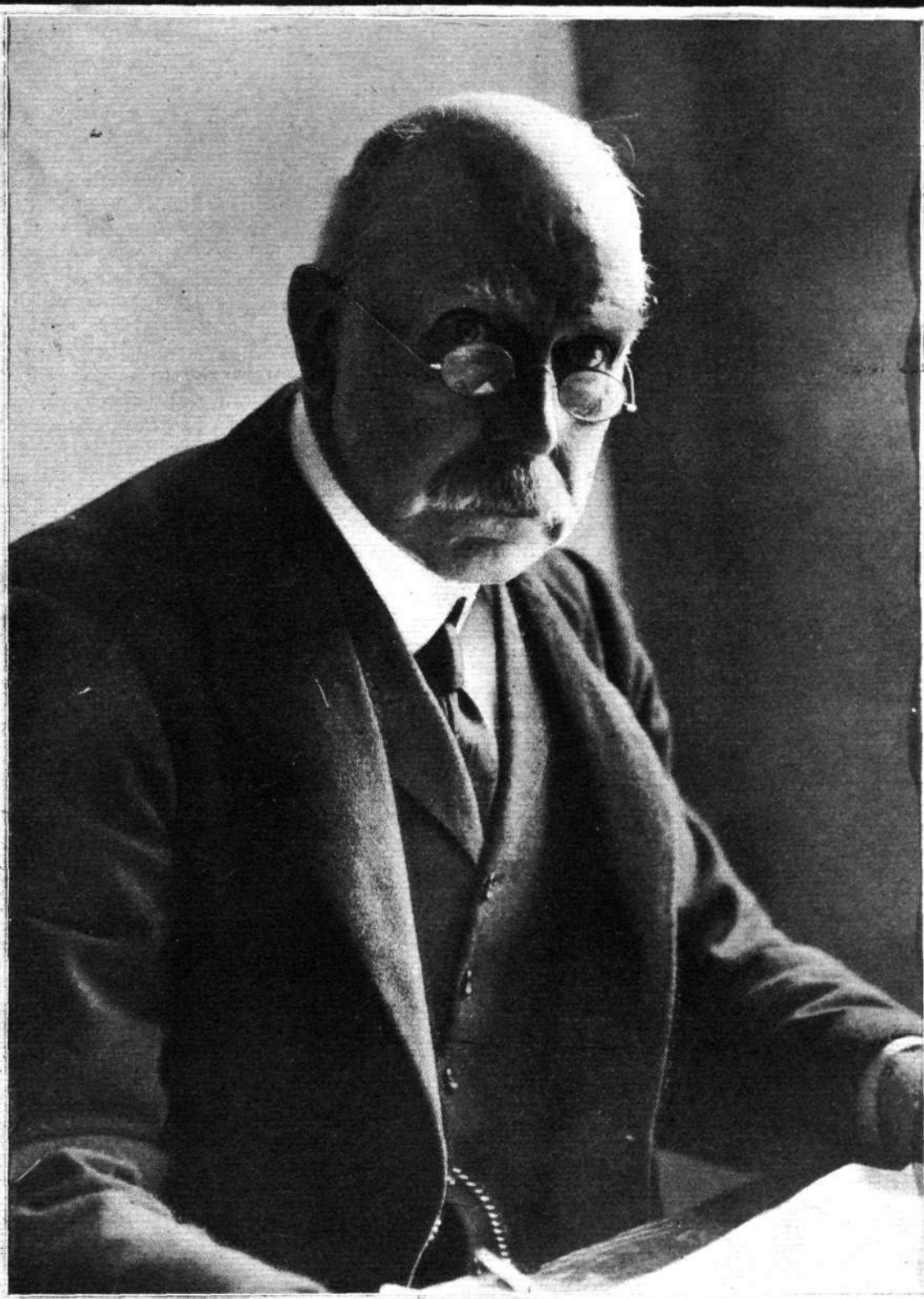
We can fully understand the alarm in France. The Hun cannot be trusted for a moment, and we have no shadow of doubt that if and when he thinks he has a fair chance of reversing the results of the Great War he will not hesitate for a moment, but will strike, hard and suddenly. There is only one thing that can be done. It seems to be fairly clear that we cannot forbid aerial development in Germany. After all, the War is over, and we are now at peace with the Hun—he is now numbered among the "friendly" nations. Aviation has an enormous commercial future, and we cannot expect to keep its development to ourselves and our Allies simply because aircraft can be converted at short notice into engines of war.

Germany must have her share in that development, and if she chooses to take it none can prevent her so doing. This is one of the risks that will have to be faced with our eyes open, and must be taken closely into account in fixing the measure of our own preparations against surprise. It is not a matter that concerns France alone. We are pledged by treaty to assist our Ally in case of unprovoked attack upon her, and, further, it is as certain as that night follows day that Germany would not dream of attacking France unless she were prepared at the same time to deliver a similar attack on ourselves. Undoubtedly, we shall have to prepare against surprise by taking similar counter-measures. If it be substantiated that Germany is in fact subsidising all these commercial services, we shall have to do something of the same sort. As a matter of fact, we ourselves have for some time been urging our own Government to give us a plain statement of aerial policy. As we have repeatedly pointed out, it is not necessary that we should maintain a huge and costly active Air Force which may never be used. What should be done is precisely what it is alleged the Germans are doing now. They are, it is said, organising comprehensive commercial services, ostensibly under private business auspices, but with the Government in the background to give a helping hand to development. They have inaugurated what they are pleased to call an Airmen's Union, which is in fact the same sort of Flying Reserve we have advocated as being the best type of organisation for ourselves. Whether our French Allies will respond to the menace—for it unquestionably is a menace—by taking similar measures we do not know. Nothing has transpired so far to lead us to think it is contemplated. But whatever is done by way of answer on the other side of the Channel, our own duty is clear. It is Britain that the Hun always has in mind when he sets about the task of aggressive organisation. It is Britain that is the arch-enemy, and we should be criminally foolish to think in any other terms. The Hun is unchanged and unchastened, and we may be certain that if we are so supine as to allow him to gain a preponderating lead in the air, he will not be slow to take advantage of the opportunity of gaining what he failed to obtain in the last War.

The R.A.F. as a Separate Service

Last week, in dealing with the new organisation of the R.A.F. details attached to the Navy, we deduced that it had been absolutely and definitely decided that the rumoured intention of reverting to the old arrangement of dual Air Services

Flight—And the Men



"Flight" Copyright.

SIR NAPIER SHAW, M.A., Sc.D., F.R.S., F.R.A.S., Kt., Director of the Meteorological Office and head of the Meteorological Department of the Air Ministry

was to be thrown overboard, and that the R.A.F. was to continue as a separate Service. For our own part, we have never had any real doubts about this. There has been a great deal of talk and rumour, and we know as a fact that a lot of intriguing has gone on behind the scenes, directed to once more cleaving the Air Service in twain and reverting it to the direct control of the Admiralty and the War Office. But after the experience of the War and the lessons it taught, and particularly regarding the view that is finding increasing acceptance among high military and naval authorities that the next war will be decided absolutely by air power, it is surely unthinkable that the Government could ever have seriously contemplated—even in the sacred name of economy—going back to the bad old organisation of two Air Services. Undoubtedly, the question of scrapping the Air Ministry, and with it the R.A.F. as a separate Service, has been recently discussed, but it is now definitely stated that the idea has been completely dropped, and that the R.A.F. is to continue along the lines of its present organisation. Although, as we have said, we never seriously believed that anything would come of the discussions, it is a relief to be assured that there is an end of them, and we trust most sincerely that they will never be revived again.

Now that the tongue of rumour has been stilled in the one direction, it has become busy in another. The latest report that is going the rounds is to the effect that Gen. Sykes is shortly to be appointed Air Minister, thus relieving Mr. Churchill, who combines that office with the Secretaryship for War. We are quite prepared for a change in the head of the Air Ministry, but we do not think for a moment there is anything in the specific rumour to which we allude. It is more than a little interesting, however, as indicating a particular trend of thought among the

rumour-mongers. Gen. Sykes, it is well known, is at the head of the Department of Civil Aviation, and that his name should be coupled with the post of Secretary of State is significant of the importance which is beginning to be attached to the development of civil aviation. We trust the coincidence is of good omen, and that the Government is really determined—when it can spare time from the settlement of industrial unrest and the endeavour to reconstruct our finances—to outline a real policy for developing civil aviation.

The Flying Services Fund

On another page we publish the text of an appeal by H.R.H. Prince Albert, himself an officer of the R.A.F., on behalf of the Flying Services Fund, which we feel sure will go straight to the hearts of our readers. The War is over, and, unfortunately, there seems to be a disposition abroad to cease giving to funds such as that which is the subject of appeal. People are apt to think, apparently, that with the conclusion of hostilities the necessity for supporting what they regard as purely war charities has ceased. This is not by any means the case. We still have some of the direst effects of war with us. As Prince Albert points out, the demands on the Fund now call for a monthly disbursement of £400 for grants and allowances, while in addition there are over 300 children of dependents of those killed in the service of the country to be educated. It is estimated that the necessities of the Fund will continue for at least another ten years. Therefore, it is evident that a large measure of support will have to be forthcoming if the Fund is to continue its good work. The appeal made by Prince Albert will not, we are sure, fall on deaf ears.

General Sykes to Visit Canada and America

MAJOR-GENERAL SIR F. H. SYKES, Contoller-General of Civil Aviation, has arranged to visit Canada, the United States, and, if possible, Newfoundland. He expects to leave England in a few days.

The visit has been in contemplation for some time, but it had to be postponed until recently on account of the pressure of business relating to civil aviation and the organisation of the Department. Even now it will not be possible for Gen. Sykes to make anything but a relatively short stay in America and the Dominion. Gen. Sykes's mission relates to the development of international civil flying.

Aerial Lighthouse at Hounslow

THE following "Notice to Airmen" has been issued by the Air Ministry:—

"Hounslow aerodrome is temporarily equipped for night flying. Each evening for a period at sunset a lighthouse in the aerodrome will give three flashes every ten seconds in the following order: Flash, one second; eclipse, one second; flash, one second; eclipse, one second; flash, one second; eclipse, five seconds. Ground searchlights and landing flares will also be displayed.

"These lights will be provided at any time during the night, if notification is made to Hounslow that machines intend to land, or if a machine is heard in the air. These arrangements are subject to alteration of which due notification will be given."

An R.A.F. Officers' Selection Board

THE Air Ministry announces that a Selection Board has been formed in order to advise the Air Council as to the award of promotions to post-War R.A.F. officers, and to decide the procedure to be followed in future for the periodical selection of officers for promotion. The following are the members of the first Board:—Air Marshal Sir H. M. Trenchard, Bart., K.C.B., D.S.O.; Rear-Admiral C. F. Lambert; Air Vice-Marshal Sir J. M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O.; Air Vice-Marshal A. V. Vyvyan, C.B., D.S.O.; Secretary, Squadron-Leader H. L. Jackson.

Telegraphic Address of Civil Aviation Department

It is notified by the Air Ministry that the telegraphic address of the Civil Aviation Department, Air Ministry, is now:—"Aircivil, Airministry, London." The telegraphic address "Civiatory, Estrand, London" has been cancelled.

Air Work in Russia

FROM the scanty details which are to hand, it appears that the R.A.F. detachment carried in H.M.S. *Vindictive* in the Baltic is rendering good service under adverse conditions. A Red destroyer was bombed on October 30, and four bombs were dropped on the Putiloff Works by an aeroplane which flew over Petrograd. Aerial photographs of Krasnaya Gorka show that the westernmost 6-in. battery has been severely dealt with by our bombs, but the anti-aircraft defence is now stronger and more accurate. It is reported that on October 26, one of our seaplanes was shot down off Kronstadt. A fast British motor-boat went to its succour, but arrived too late, the plane having been towed off by the Bolsheviks. The R.A.F. detachment is under the command of Major Donald and Capt. Grace.

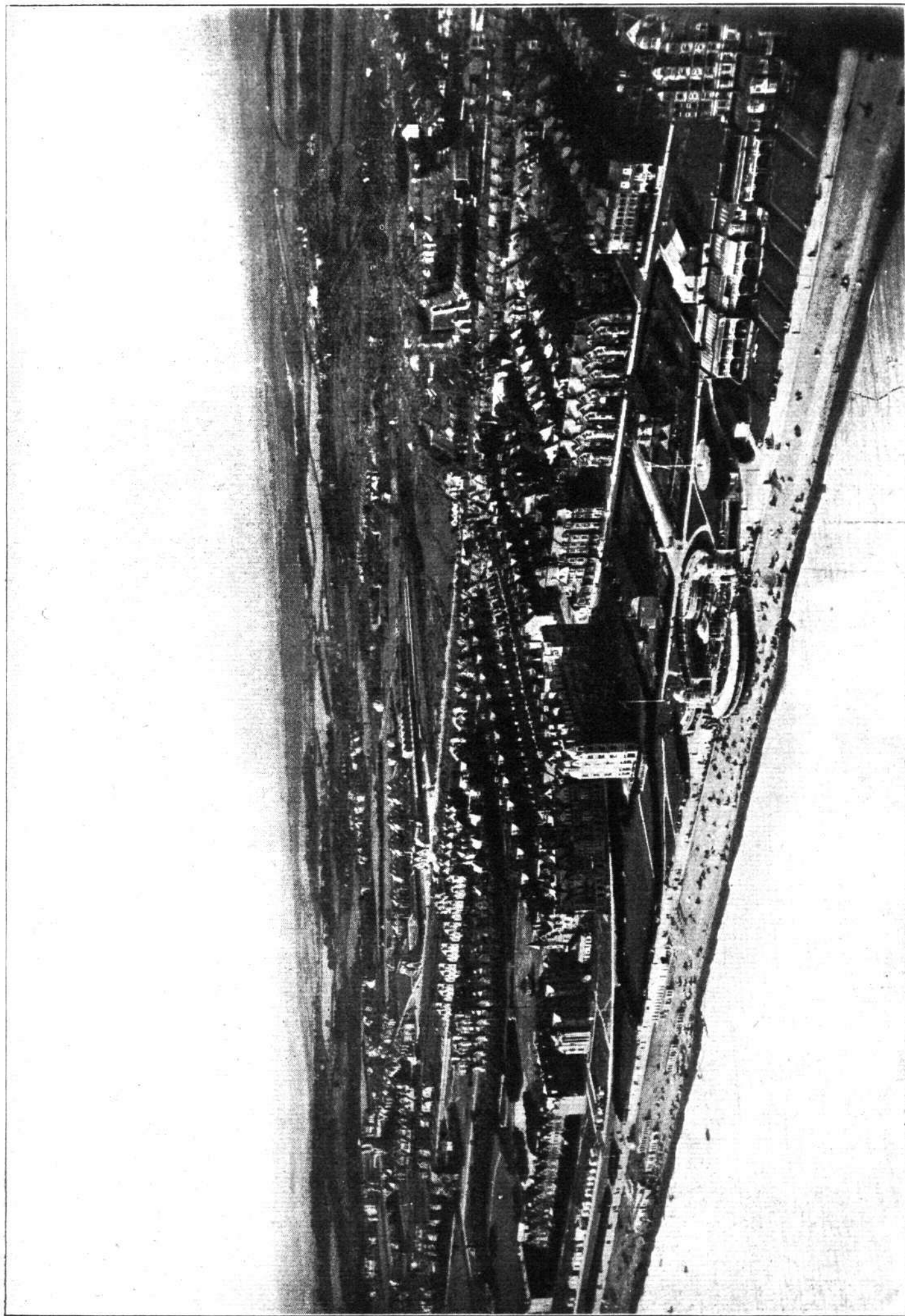
U.S. Air Service

A STRONG plea for a separate Air Service for the United States was made on October 27 by Senator Wadsworth, Chairman of the Military Affairs Committee of the Senate, and he also protested against the refusal of an appropriation of £3,000,000 demanded for military aeronautics. He asserted that since the Armistice aviation in the United States had fallen to a shameful position, behind France and England, both of which countries had recognised the commercial value of aviation.

The Service Estimates

IN the White papers published last week giving the revised estimates, the R.A.F. is the only Service to show a reduction. The estimate in the Budget of £66,500,000 is reduced to £57,500,000, due to the transfer of expenditure on winding up aircraft contracts to the Vote for the Ministry of Munitions. Provision is made for increased pay of the Air Force (£100,000).

The Camera and the 'Plane



Bexhill-on-Sea from an Avro seaplane

"Flight" Copyright

THE FLIGHT TO AUSTRALIA

IN connection with the flight to Australia, for which the Australian Government has offered a prize of £10,000, events now appear to indicate that this competition may almost amount to a race. The Sopwith machine entered for this flight left Hounslow some time ago, and was, as recorded in **FLIGHT** at the time, obliged to descend near Cologne. Some speculation as to the reasons for landing there has been occupying the minds of many interested in the flight. We are informed that the machine and engine are both quite all right, and that what caused the descent was exceptionally bad weather. The machine left Hounslow in reasonably good weather, but after crossing into France fogs were encountered and it was only occasionally that Capt. Matthews caught a glimpse of the ground. One of these showed him that he was over Ypres, and he had some trouble in finding Marquise aerodrome. However, this he ultimately succeeded in doing, and spent the night there. He left Marquise next morning, again meeting with very bad weather. Through a rift in the clouds he discovered a town below and decided to come down to enquire. After cruising about for nearly an hour he found a landing ground, and discovered that he was at Cologne. Apparently a very strong wind had upset all his calculations, and as he could not see the ground he had no means of ascertaining his actual drift. Continuous bad weather kept the "Wallaby" at Cologne until November 2, when a start was made. Even then, it was only possible to get on to Mayence.

In addition to the Sopwith "Wallaby" three other machines are now all but ready for the attempt, and are mainly waiting for an improvement in the weather before making a start. These are: A Martinsyde, an Alliance, and a Vickers-Vimy. As all the machines must start from Hounslow it would appear that the arrival of better weather will mean the start of all three machines more or less together, and an exciting race may therefore be looked to.

The Alliance Machine

The machine entered by the Alliance Aeroplane Co., Ltd., is, generally speaking, similar to the "Seabird" which flew from London to Madrid. It is a tractor biplane with totally enclosed fuselage. The pilot occupies the rear of the cabin, control being by means of hand wheel and foot bar. Windows in the side allow of looking out laterally and to a certain extent at an angle forward. A triangular opening in the side, level with the pilot's head permits him, if desired, to put his head outside, when he can see fairly well in a forward direction. The engine fitted in this machine is a Napier Lion of 450 h.p. As will be seen from the accompanying photograph, the engine is totally covered in, only the exhaust pipes projecting, and the forward corner of the outer banks of cylinders. The fuel tanks, which have a capacity of about 500 gallons of petrol, are mounted inside the body, in front of the cabin. The machine has a maximum speed of about 135 m.p.h.

Lieut. Roger Douglas, who will pilot the machine, was

born in Queensland, and enlisted in the A.I.F. at the outbreak of War. He was at the landing on Gallipoli with the Australian Machine Gun Battalion; from there he went to Egypt, and ultimately arrived in France with the first contingent of the A.I.F. He was Sergt. in those days, and for bravery in the face of the enemy at Pozieres in 1916, was awarded the D.C.M., afterwards receiving his Commission on the Field. He gained a further decoration, viz., the M.C., at Polygon Wood in September, 1917. Having thoroughly proved himself on land, Lieut. Douglas sought fresh fields to conquer and joined the Australian Flying Corps. After doing good work in France, he was selected as instructor of



Photo. by Birkett.

THE FLIGHT TO AUSTRALIA: Lieut. Roger Douglas, M.C., D.C.M., who will pilot the Alliance machine, and his navigator, Lieut. J. S. L. Ross, of the Australian Flying Corps.



Photo. by Birkett.

THE FLIGHT TO AUSTRALIA: Side view of the Alliance machine, 450 h.p. Napier Lion engine

a Scout section of S.E. 5's; he underwent a course of navigation at Andover, so besides being an experienced pilot he is also a capable navigator.

Lieut. Ross, who will be the navigator of the machine, has also had considerable flying experience. He joined up early in the War as a Wireless operator, and received his commission and pilot's wings in October, 1916. He served continuously with the A.F.C. in France until September, 1918, when he was wounded in aerial combat whilst in charge of a squadron of S.E. 5's. He has also had considerable training in navigation, and both men have been working together since the Armistice.

Lieut. Douglas first conceived the idea of flying home in 1916, and immediately the Armistice was declared, he set out to obtain a machine capable of long distance flying. He has now had some weeks' experience in flying an Alliance

restful to the eyes on a long trip. It is intended to carry sufficient food to last five days.

The Martinsyde Machine

With the exception of a few alterations in the seating arrangement, the machine entered by Messrs. Martinsyde, Ltd., of Woking, is similar to the standard Martinsyde Commercial Type "A 1." It is fitted with a Rolls-Royce Falcon III engine, of 275 h.p. Like all Martinsyde aeroplanes this machine is of extremely pleasing outline, as will be seen from the accompanying illustrations.

On the present venture, in addition to Capt. Howell and his mechanic, the machine will carry fuel for 10 hours—giving it a range of about 1,000 miles—spare parts for engine and machine, tool kits, etc.; a total weight of about 1,000 lbs. With this load the machine's most economical cruising speed is

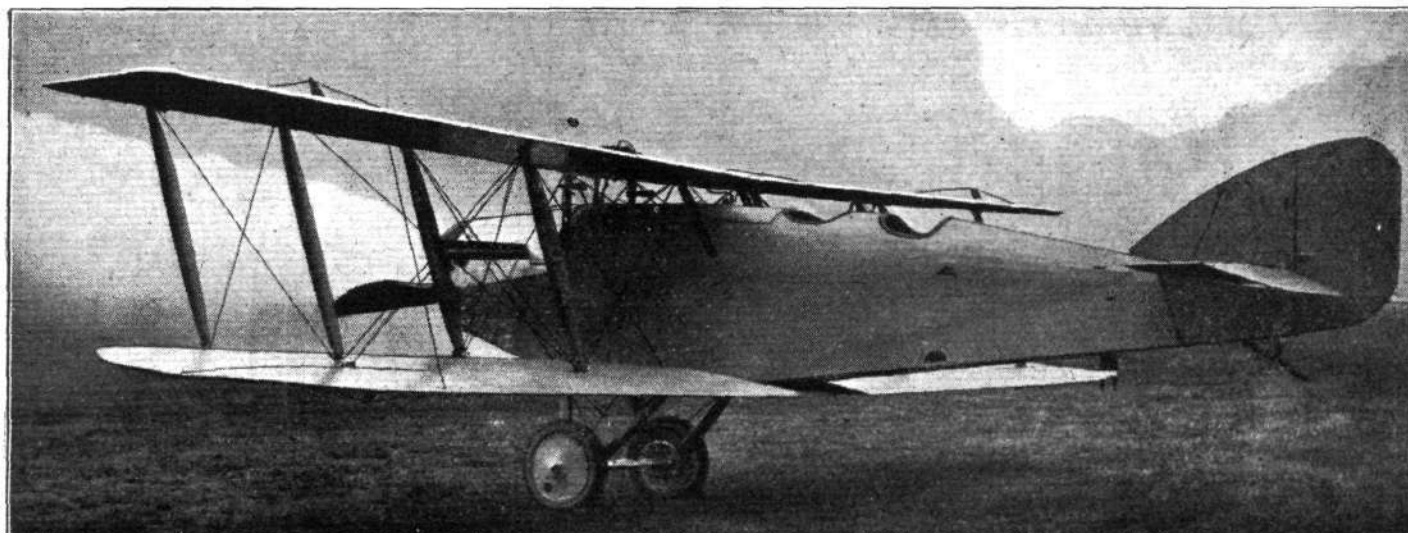


THE FLIGHT TO AUSTRALIA: On the left the pilot-navigator of the Martinsyde machine, Capt. Howell, D.S.O., D.F.C., M.C.; and on the right, his engineer, Corpl. George Henry Fraser

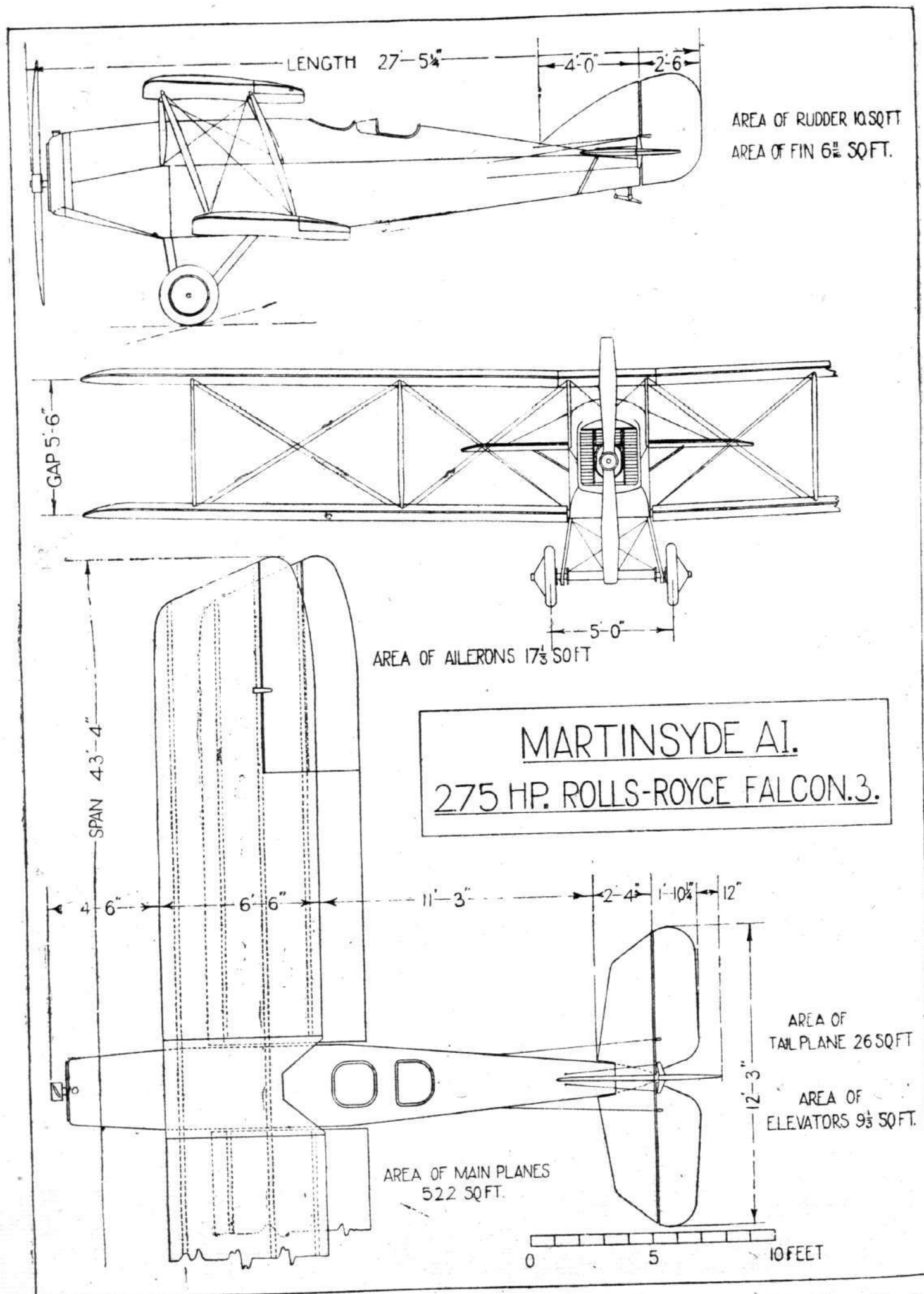
aeroplane fitted with a 450 h.p. Napier aero engine, and is confident that he could not have secured a better machine for this flight. It is particularly steady in the air, has ample reserve of power, and the engine, with many remarkable performances to its credit, is firmly expected to do all that is asked of it. Every point has been considered in the preparations for this flight, even to such small items as painting the wings and struts green, so that they will be

100 m.p.h. Capt. Howell will use the land route so far as Calcutta, where he will fit floats and use the sea route from there onwards. These floats are interchangeable with the standard land under carriage, and do not entail any alteration or adjustment to the machine, the same fittings being used for both types of undercarriage.

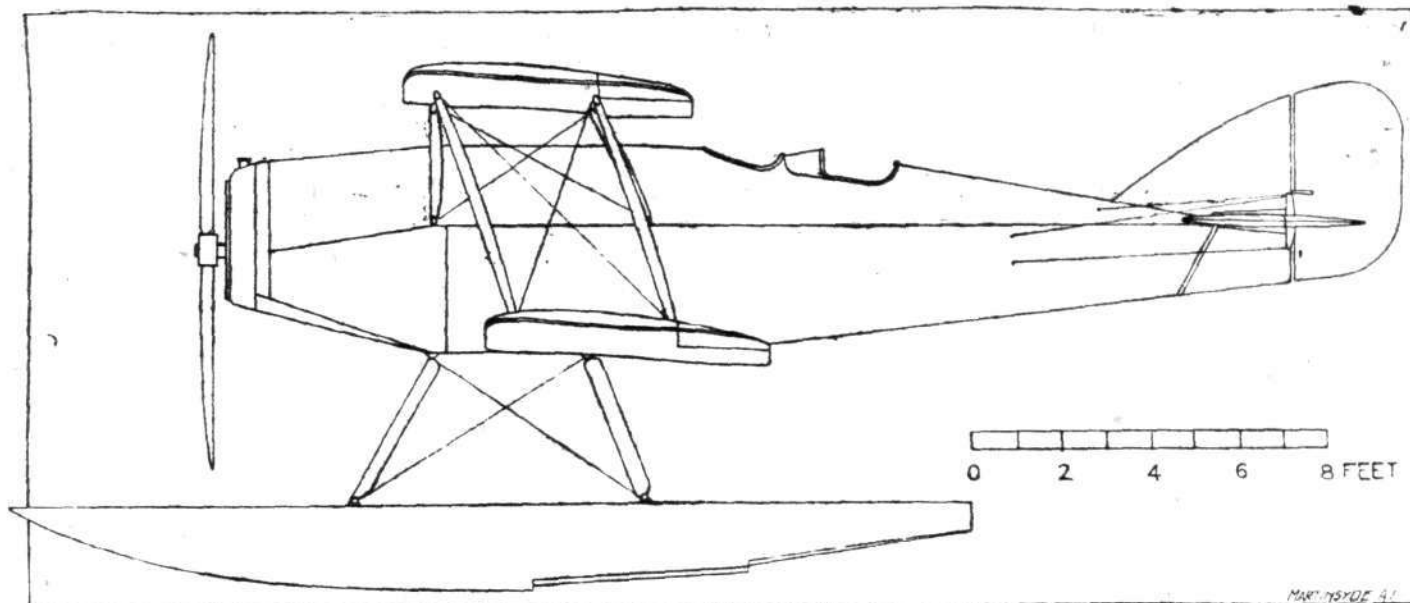
On test these floats behaved exceedingly well, the machine rising off the water quickly and showing no tendency to



THE MARTINSYDE MACHINE ENTERED FOR THE FLIGHT TO AUSTRALIA: Three-quarter rear view



THE MARTINSYDE MACHINE ENTERED FOR THE ENGLAND-AUSTRALIA FLIGHT : Plan, side and front elevations to scale



THE FLIGHT TO AUSTRALIA : Side elevation of the Martinsyde machine fitted with floats for the last stages of the journey

porpoise ; nor did the floats affect the handling of the machine in the air. The floats add about 400 lbs. to the weight of the machine, but no difficulty is experienced in carrying the full load.

Capt. Howell thinks the sea route from Calcutta onwards solves the difficulties of bad flying country and the complete lack of landing grounds, prepared or otherwise.

The Vicker's Machine

The machine entered by Messrs. Vickers, Ltd., is a standard Vickers-Vimy-Rolls bomber, which will be piloted by Capt. Ross Smith, M.C., D.F.C., A.F.C., and by his brother, Lieut. Keith Macpherson Smith. The machine is identical to those supplied to the Royal Air Force. It will be remembered that one of these machines was earmarked for the bombing of Berlin just previous to the Armistice. It is also similar to the machine used by Capt. Sir John Alcock, K.B.E., D.S.C., for his Transatlantic flight, except that for this flight a smaller petrol capacity is required. The engines used are the Rolls-Royce "Eagle," Mark VIII. The petrol is drawn from the main petrol tanks by two Vickers Mark II centrifugal petrol pumps, and delivered to the service tank, which forms a section of the top plane, from which it runs by gravity to the engines.

The maximum speed is over 100 m.p.h., but Capt. Ross Smith intends to throttle the engines down to a cruising speed of about 90 m.p.h. The weight of the machine empty is three tons ; when carrying her full load on this flight, consisting of 4 men, 516 gallons of petrol, 40 gallons of oil and 10 gallons of water, together with spares, kit, tools and sundries (adding another 800 lbs.), the total weight fully loaded will be nearly $5\frac{1}{2}$ tons.

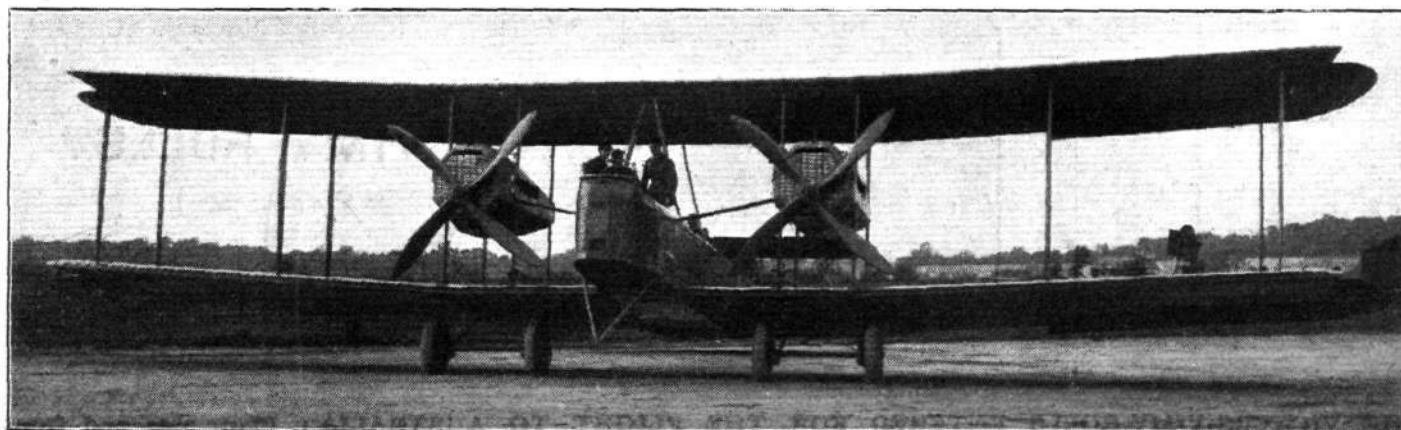
Capt. R. Smith and his brother, Lieut. K. M. Smith, were both born and educated at Adelaide, South Australia. At the outbreak of War, Capt. Ross Smith enlisted in the 3rd

Australian Light Horse Regiment as a private, and sailed with the first Australian Expeditionary Force, landing in Egypt in December, 1914. After four months on Gallipoli he gained his commission, but later on contracted enteric fever and was invalided to England. He rejoined his regiment in March, 1916, was afterwards sent back to the Sinai Desert, and took part in the battle of Romani during the last Turkish attack on the Suez Canal in August, 1916. In October of the same year he joined the 6th (Australian) Squadron, Royal Flying Corps, as an observer, qualifying as a pilot in Egypt in July, 1917. He then rejoined his old squadron, now known as No. 1 Squadron, Australian Flying Corps, stationed in Southern Palestine, and remained there until the Armistice.

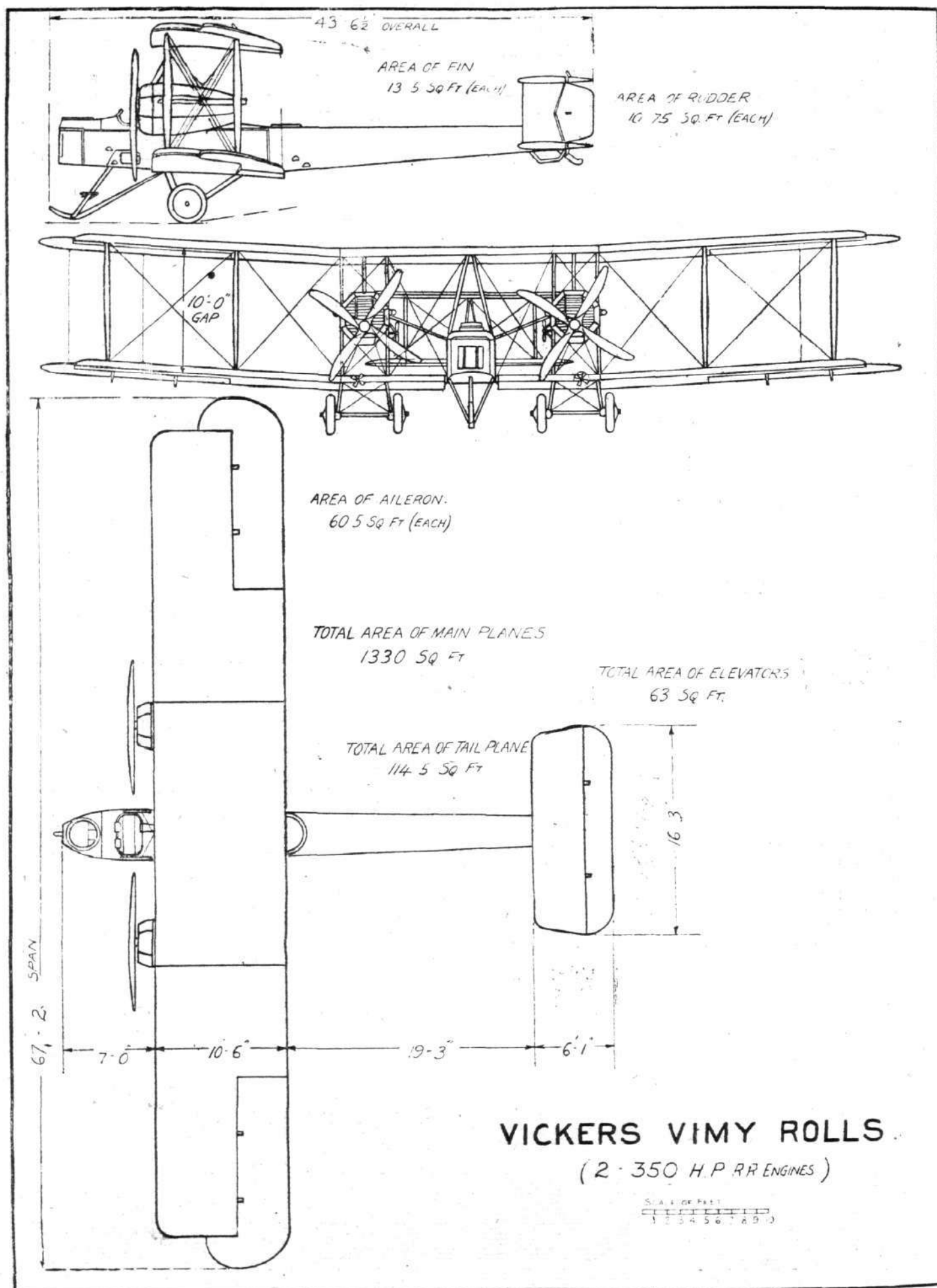
In December, 1918, he accompanied Air Vice-Marshal Sir W. G. H. Salmond, K.C.M.G., C.B., D.S.O., and Air Commodore A. E. Borton, C.M.G., D.S.O., A.F.C., on the first flight from Cairo to Calcutta, and after arriving at Calcutta, proceeded with Air Commodore A. E. Borton on his reconnaissance for aerodromes in Burma, Siam, Malay States and the Netherland East Indies. He returned to England about a month ago.

His brother, Lieut. Keith Macpherson Smith, R.A.F., will act as reserve pilot and observer. After leaving school, Lieut. K. M. Smith joined the staff of Messrs. Elder, Smith & Co., Ltd., of Adelaide, and on the outbreak of War offered his services for Overseas with the Australian Imperial Force, but was rejected. Several renewed attempts to enlist in 1915 and 1916 met with the same result, but subsequently he underwent an operation which considerably improved his health, and afterwards proceeded to England by the P. & O. steamship *Medina*, which was torpedoed and sunk in the English Channel during the voyage.

On arrival in England he joined the Royal Flying Corps as a cadet, shortly after becoming a pilot of unusual ability,



THE FLIGHT TO AUSTRALIA : The Vickers-Vimy-Rolls entered for the flight to Australia



THE VICKERS-VIMY-ROLLS ENTERED FOR THE FLIGHT TO AUSTRALIA : Plan, side and front elevations, to scale



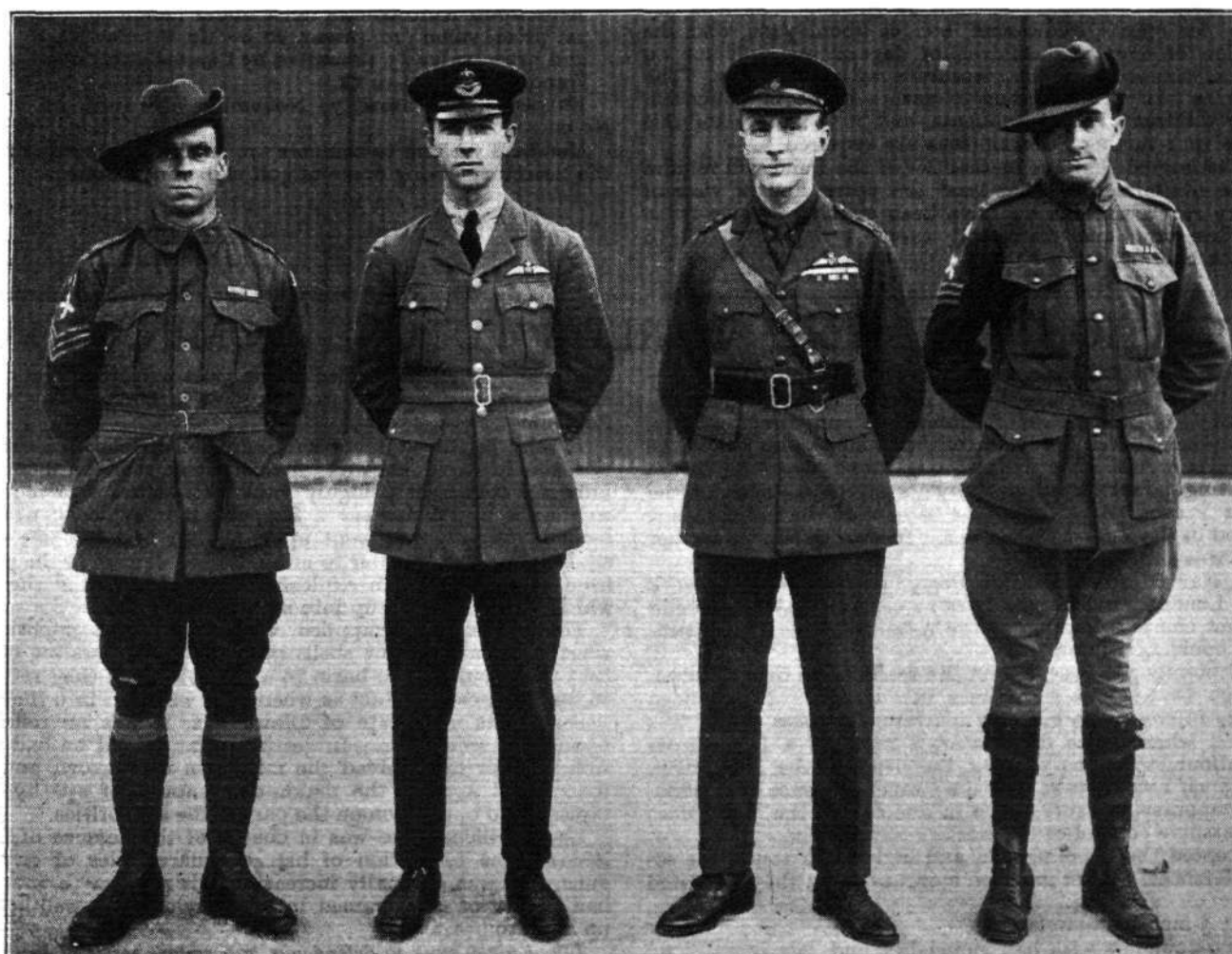
The Flight to
Australia : Going
over all the de-
tails of the
Vickers-Vimy to
see that all is in
order

and was serving as an instructor in the North of England until the Armistice.

Capt. Ross Smith and his brother will be accompanied by Sergt. J. W. Bennett, A.F.M., M.S.M., and Sergt. W. H. Shiers, A.F.M., who will act as engineers.

Sergt. W. H. Shiers was also born and educated at Adelaide, and spent his early life on a farm. Later on he went to Broken Hill, New South Wales, and worked at the North Mine as an electrical engineer. He was a student at the Technical College at Broken Hill, studying engineering and

mechanics in his spare time, and seven years afterwards proceeded to Barren Jack Irrigation Scheme in New South Wales as an electrician for the Yanks-Leeton area in connection with Government contracts. In March, 1915, he enlisted in the 4th Divisional Artillery at Sydney, and was sent to Egypt, where he transferred to the 1st Australian Light Horse Regiment. He took part in the battle of Romani, and in October, 1916, was posted to the 67th (Australian) Squadron, Royal Flying Corps, as a mechanic. He rapidly gained promotion, and owing to his ability and



THE FLIGHT TO AUSTRALIA : The Vickers crew. Reading from left to right : Sergt. W. H. Shiers, A.F.M., Lieut. K. M. Smith, R.A.F., Capt. Ross Smith, M.C., D.F.C., A.F.C., and Sergt. J. M. Bennett, M.S.M., A.F.M.

resourcefulness he was on many occasions sent out in the Desert to bring in crashed or damaged machines, which was at times a most difficult and arduous task. He has handled almost every type of engine, and for the last 12 months of the War was working on Rolls-Royce engines.

Sergt. J. W. Bennett was born at St. Kilda, Melbourne, in 1892, and spent 14 years of his early life at Hawthorn, Melbourne, where he received a public school education, and attended night technical classes. He took great interest in all things connected with the early progress of the internal combustion engine, both for car and aviation use, received a thorough and early training with Salway motor engineers, and was employed for a considerable time with other prominent motor firms in Australia. At the outbreak of war in 1914, he was on the mechanical staff of Messrs. Denny Lascells, Motor Department, Melbourne, but enlisted in the Mechanical Transport, Australian Imperial Forces, sailing as a 1st Class

Air Mechanic in No. 1 Squadron, Australian Flying Corps, with which he served in Egypt and Palestine until the Armistice.

On account of the excellent records of these two sergeants, they were specially selected to accompany Air Vice-Marshal Sir W. G. H. Salmond, K.C.M.G., C.B., D.S.O., Air Commodore A. E. Borton, C.M.G., D.S.O., A.F.C., and Capt. Ross Smith, M.C., D.F.C., A.F.C., on the first Cairo to Calcutta flight, and Air Vice-Marshal Sir W. G. H. Salmond stated in India that the success of the flight was largely due to their skill and knowledge. They were subsequently awarded the Air Force medal for their work in connection with this flight, and accompanied Air Commodore A. E. Borton and Capt. Ross Smith on their reconnaissance for aerodromes in Burma, Siam, Malay States and Netherland East Indies. On returning to India, they both served with the North-West Frontier Forces in the late Afghan War.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

THE FLYING SERVICES FUND.

(Chairman: H.R.H. PRINCE ALBERT, K.G.)

I AM appealing for further Subscriptions to the Flying Services Fund, which is administered by the Royal Aero Club.

This Fund was established by the Club in 1914 for the benefit of Officers and men of the R.N.A.S. and R.F.C. (now the R.A.F.) who were incapacitated on active service, and for the widows and dependents of those who were killed.

The expenses of administration are borne by the Royal Aero Club, and all Subscriptions are devoted entirely to those requiring relief.

The Subscriptions received amount to £15,000 and the sums which have been expended to date in grants, allowances and the education of children amount to £6,000. The monthly liability for grants, allowances, etc., is about £400, and the education of over 300 children of dependents calls for an increasing expenditure commensurate with their ages. The Committee are most anxious to ensure a proper education for the children of all dependents, and it is mainly for this purpose that further Subscriptions are required.

It is estimated that the necessities of the Fund will require it to be administered for at least ten years, and in view of the very real assistance we have been enabled to give to so many deserving and distressing cases, I appeal to all to subscribe liberally to this Fund.

Subscriptions should be forwarded to Lord Kinnaird, K.T., Honorary Treasurer, Flying Services Fund, Barclays Bank, Ltd., 4, Pall Mall East, London, S.W. 1, or to me at the Royal Aero Club, 3, Clifford Street, London, W. 1.

ALBERT,
Chairman.

Golf Meeting

Addington Golf Course, near Croydon, Tuesday, November 18, 1919, commencing at 9.30 a.m.

Morning Round.—18 holes, under handicap medal round 1st prize, value £10, presented by Lieut.-Col. F. K. McClean and Lieut.-Col. J. T. C. Moore-Brabazon, M.P.

2nd prize, value £5, presented by Mr. E. W. Touboul.

Afternoon Round.—18 holes under handicap. Bogey.

1st prize, value £10, presented by Mr. Stanley May.

2nd prize, value £5, presented by Lieut.-Col. Charles Jarrott. Handicap limited to 18.

Entries close Thursday, November 13, 1919, at 6 p.m. No entrance fee.

Members wishing to compete are to forward their names to the Secretary giving name of golf club and handicap.

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary.

AVIATION AND THE WORLD'S FUTURE DOMINATION

In the *Evening Standard* a summary of Admiral Sir Percy Scott's book "Fifty Years in the Royal Navy" has recently appeared. As in the case of submarines and director-firing, Sir Percy has proved his correctness of vision years before the event. He takes an equally strong stand over the future dominating power of aircraft by its strength ensuring the World's Peace. Here is what he says upon the subject, as it appeared in the *Evening Standard*. In our leaders we further refer to this subject:—

THE War Office, writes Sir Percy, in narrating his work on the London air defences, was as certain that a Zeppelin could not come to London as the Admiralty was that a submarine could not sink a ship.

On September 8, 1915, a Zeppelin really came over London. Although throughout my career in the Navy I had been specially interested in gunnery matters, I confess that I was surprised when, three days later, I received a letter from Mr. Balfour, who was then at the head of the Admiralty, asking me if I would take over the gunnery defence of London, as a temporary measure, since in due course the War Office would assume control of the work.

I accepted the appointment, and had a look round the so-called defences. After fourteen months of war they consisted of:—

Eight 3-inch high-angle guns,

Four 6-pounders with bad gun sights, and

Six pom-poms and some Maxims, which would not fire up as high as a Zeppelin, and were consequently only a danger to the population.

The ammunition supplied to the guns was quite unsuitable, and was more dangerous to the people in London than to the Zeppelins above.

In selecting the ammunition to fire at Zeppelins the authorities should have known: first, that a shell with a large bursting charge of a highly explosive nature was required, so that it would damage a Zeppelin if it exploded near it; second, that all that went up in the air had to come down again, and that, in order to minimise the danger to the public from falling pieces, an explosive should be used in the shell which would break it up into small fragments.

The ammunition supplied was exactly the opposite to what we wanted. The shells had so small a bursting charge that they could do no harm to a Zeppelin, and they returned to earth almost as intact as when they were put into the guns.

Serious as this state of affairs was, it was no reflection upon my predecessor. In getting what he did he had done wonders, for he received the minimum of support, and had to contend against the maximum amount of apathy, red-tapism, and opposition on the part of the authorities.

Gen. Gallieni, who was in charge of the defence of Paris, had for the protection of his 49 square miles of city 215 guns, and was gradually increasing this number to 300. He had plenty of men trained in night-flying, and well-lighted-up aerodromes.

I had eight guns to defend our 700 square miles of the metropolitan area, no trained airmen, and no lighted-up aerodromes.

This was the state of affairs when the Admiralty handed the blunder over to me. To cheer me up they informed me

that they could not give me any more guns at once, and that, although they had been experimenting for ten years, they had no time-fuse suitable for exploding high-explosive shell.

The only guns they had mounted on mobile mountings were Maxims, which were of no use against Zeppelins; they had no airmen who could fly at night, and if they had had them they would have been of no use, as there was no ammunition suitable for attacking Zeppelins.

The first thing was to find a satisfactory fuse. The Admiralty said that they had been ten years trying to get one and had not succeeded. One of my staff, Comdr. Rawlinson, C.M.G., D.S.O., solved the difficulty in ten minutes. The next thing was to get a design of high explosive shell which could be quickly manufactured.

The next thing was to get more guns. I knew that the Navy had some they could spare and which could be converted into anti-Zeppelin guns. I applied to the Admiralty for these guns, and promptly got a very big "NO."

I had anticipated this reply by writing to Sir John Jellicoe, the Commander-in-Chief of the Grand Fleet, and asking him for them. He promptly wired back that I could have twenty.

We extracted out of the Admiralty with difficulty another fourteen guns; Lord Kitchener very promptly gave me some; and with others that we picked up I found that in a very short time we had increased our number of guns from 12 to 118. But, unfortunately, mountings had to be made for these, which took a considerable time.

The few guns we had for the defence of London were mounted permanently in positions probably as well known to the Germans as to ourselves. We had no efficient guns mounted on mobile carriages which could be moved about and brought into action where necessary.

The French, I knew, had some of their splendid 75 mm. guns mounted on automobile carriages. I suggested to the Admiralty that they should ask the French Government either to supply or loan me one to copy. This they agreed to see about, and I have no doubt that in a few months they would have got the necessary papers through.

I was determined not to work their way. I wanted the guns, not papers, so I ordered Comdr. Rawlinson, a very clever officer, who spoke French like a Frenchman, to go over to Paris at once, and either beg, borrow, or steal a gun.

I told him he was to have it on the Horse Guards Parade, under Mr. Balfour's window, in less than a week. He was in a motor-car at the time. Looking at his watch, he said, "I can catch the boat. Please wire Folkestone to ship me and the car over to France."

Thus he left, going at about 50 miles an hour down South Audley Street. That is the sort of officer that is wanted in war-time! Twenty-four hours after leaving me he wired: "Have got gun, two automobiles, and ammunition."

Owing to the promptitude of Comdr. Rawlinson, we had this gun on the Horse Guards Parade under Mr. Balfour's window, before the official letter asking for it was written.

Although this was only one gun, its acquisition was very valuable, as it showed us what could be done, and how to do it. The rapidity of the French decision ought to have taught our deliberate Admiralty a lesson, but it did not; nothing could put any life into their movements.

With the French gun as a guide, we very soon mounted up eight of our own three-pounders on motor lorries, which gave a start to the mobile section of our defence.

Although the Admiralty did not give me any assistance as regards the defence of London, they wanted me to comply with their slow and unsatisfactory routine. But we were at war. Had I submitted it would have taken me fifteen months to get twelve guns, whereas I was aiming at getting 150 guns in six months. So I did not agree, and wrote to Mr. Balfour.

Mr. Balfour kindly arranged that my work should not be hampered by the ordinary Admiralty red-tapeism, so I was able to go ahead, and the defence of London, as far as guns were concerned, advanced rapidly. But not rapidly enough, so I went over to France to see if the French would help me again.

When I told Gen. Gallieni the number of guns we had, he laughed and expressed surprise that the Zeppelins did not come every day.

He was a splendid officer, and promptitude itself. Five minutes' conversation, and it was decided that I should have 34 of the famous French 75 mm. guns and 20,000 shells, with fuses complete.

This brought our total up to 152. They were rather a mixed lot—Mr. Asquith referred to them as rather a menagerie

—but I went on the principle that any guns were better than no guns.

On November 27 I received a letter from Mr. Balfour in which he told me that the long-drawn negotiations for the transfer of the defence of London against aircraft to the War Office were coming to an end.

I was proud to have been associated with the Anti-Aircraft Corps. It was a voluntary *corps d'élite*, composed of university men, barristers, artists, and City men. They were men of brains, who, moved by patriotic motives, put on the uniform of petty officer or able seamen and submitted in splendid spirit to the necessary conditions of service.

At noon on February 16, 1916, the War Office took over the gunnery defence of London, and consequently I was no longer responsible for it. I had commanded it for five months and six days. As my scheme of defence was not complete, it seemed a pity that new people with new ideas should take it over, but we did many peculiar things during the War.

The Future Navy

Some officers say that the battleship is more alive than ever; others declare that the battleship is dead. I considered that the battleship was dead before the Great War and I think her more dead now, if that is possible. The battleship of today costs roughly £8,000,000; she carries about 1,000 shells, containing about 100,000 lbs. of high explosive; her effective range is, say, fifteen miles; she is vulnerable to aircraft with bombs and aerial torpedoes, and to submarines, the latter carrying possibly a 15 in. or 18 in. gun, and the ordinary automobile torpedo is still in process of development, and may in future carry a ton of high explosive, which would probably sink any battleship.

For £8,000,000 we could build many aeroplane-carrying ships, equipped with aeroplanes carrying over 100,000 lbs. of high explosive. If these aeroplanes carried fuel sufficient for five hours, their range would be about 150 miles out and 150 miles home.

In the battleship we put all our eggs into one basket. In peace time the aeroplane-carrying ships could be used as passenger ships, and the aeroplanes for carrying passengers instead of bombs.

Then there is the relative cost of upkeep to be considered. The single battleship would require in peace time about—

	Pay.
	£
40 officers	8,000
800 men	60,000
Provisions and stores	30,000
Coal	10,000
	£108,000

Say £120,000 a year. The aeroplane-carrying ships and the aeroplanes would cost nothing; they would be earning money. The officers and men to form the crews of the ships would belong to the Merchant Navy. Aeroplane pilots will be as numerous as taxi-drivers and get about the same pay. The battleship waddles along at twenty miles an hour, and cannot waddle very far, and in comparison with an aeroplane has a very low rate of speed.

The object in war is to introduce high explosive material into your enemy's ships or country; transmitting this high explosive by guns is expensive, as the container of the high explosive has to be very strong, and consequently very heavy, to withstand the shock of discharge.

It takes a battleship weighing 30,000 tons to carry 100,000 lbs. of this explosive. Ten aeroplanes weighing about three tons each would carry the same amount, so the relative weights of the carriers is as 30 tons—30,000 tons.

When the battleship nears the end of her coal or ammunition, she must waddle home at about the same speed as a South-Eastern Railway train (I am told that this is the slowest line on earth), and it takes her several hours to fill up, even if she uses oil fuel. The aeroplane does not waddle home, but comes back at 100 miles an hour, and it takes three minutes to fill her up with fuel and ammunition.

The battleship is dead. The future is with the aeroplane, which is going to develop rapidly in the next few years.

My task is completed, for from the summer of 1916 onwards to the end of the War neither the Admiralty nor the War Office had further need of any services I could render. Seeing that I had retired in the year preceding the beginning of hostilities, I was indeed fortunate in being able to take some part, however small, in the prosecution of the war on the water, under the water, on the land, and in the air.

THE "BRISTOL" TOURER

THIS machine, which is a development of the famous Bristol Fighter, has been designed primarily to provide a machine of great dependability, and capable of maintaining a fairly high speed for a considerable period of time. Its petrol tanks, which carry 70 gallons, are sufficient to allow of the machine remaining in the air for a distance of about 560 miles.

of about 90 m.p.h. When the latter engine is fitted the maximum speed is 120 m.p.h. and the cruising speed 85 m.p.h. With either engine the petrol consumption for the distance traversed is the same, although taking into consideration the difference in speed the consumption with the Rolls-Royce engine is 15½ gallons per



Dual controls are normally fitted to enable the passenger to take over the pilotage during a lengthy flight if desired, although the machine can be supplied fitted with pilot's controls only. When used for the transport of mails or cargo a load of some 300 lbs. can be carried in addition to the pilot and full complement of fuel and oil, although this weight can be increased should it be desired only to carry fuel for a shorter range of flight. The machine can be fitted either with a 275 h.p. Rolls-Royce Falcon III engine or with a 230-240 h.p. Siddeley Puma engine. Fitted with the former the machine can attain a speed of about 125 m.p.h., with a normal cruising speed

hour, and with the Siddeley Puma 15 gallons per hour.

Specification. (Weights and dimensions).

Weight, empty	... 1,750 lbs.
Weight, loaded	... 2,800 lbs.
Wing span	... 39 ft. 3 ins.
Wing area	... 405 sq. ft.
Wing loading	... 6.92 lbs. per sq. ft.
Chord of wing	... 5 ft. 6 ins.
Overall length	... 25 ft. 9 ins.
Maximum height	... 10 ft. 1 in.
Tankage—petrol	... 70 gallons
Ceiling	... 20,000 ft.

The Next Schneider Cup Race

THE Aero Club of Italy is proposing that the next competition for the Schneider Cup shall be included in a meeting to be held at Venice in September of next year, several days before the motor car race to be held in the same district. Other events which are being arranged include a 1,000-kilom. race, with a speed range competition and a trial for multi-engined machines. The last-mentioned will be held over a course of 1,200 kiloms. During the first 400 kiloms. all motors will be used; in the second 400 kiloms. the twin-engined machines will use one and the three-engined machines two motors, the one not used being sealed; while the last 400 kiloms. will be run under the same conditions, except that the other motor will be used in the case of the twin-engined machines, while in the three-engined machines the motor not previously used will be working and one of the others sealed up.

A New Canadian Prize

It is announced that a new £10,000 prize, open to Canadian pilots on Canadian machines, has been offered for the first successful trans-Pacific flight from Victoria to Japan.

M. Poulet's Progress

M. POULET is making slow progress in his flight from Paris to Melbourne. He started from Avlona on October 22, but ran into a blizzard and had to go back. A few days later, however, he succeeded in getting on to Salonika, and on October 30 he went on to San Stefano.

To Test the "David"

ON Saturday at 10 a.m. Bossoutrot set out from Toussus le Noble to fly to Morocco, but this time his mount is the new popular type 40 h.p. Farman "David." The destination was Casablanca, the route of the 4,000-mile journey being via Bordeaux, Biarritz, St. Sebastian, Vittoria, Madrid, Cordova, Seville, Gibraltar, Tangier and Rabat. Some demonstration flights may be made in Morocco and the machine is then to fly back to Paris.

Air Mails in Japan

EVIDENTLY the commercial possibilities of aviation are being recognised in Japan, as it is announced that an aerial mail service is being started between Tokyo and Osaka.

'Plane Post in Finland

A DIRECT mail air route between the Finnish town Sortavala on the Ladoga and Murmansk has been started by British and French aeroplanes. The route covers practically the whole length of Finland.

A Royal Company in Holland

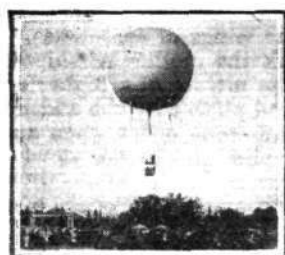
A ROYAL Dutch Aviation Company has been established at The Hague, but details as to its constitution and sphere of operation are lacking at present.

U.S. Squadron to Visit Brazil

No doubt with a view to bringing the qualities of American aircraft to the notice of the Brazilian authorities, arrangements are being made for an American flying squadron to visit Brazil early next year.

Adventures with the "Bodensee"

PASSENGERS who set out from Friedrichshafen, on November 2, in the German airship "Bodensee," had an exciting time. When the vessel arrived at the landing-ground at Staaken, about 13 miles from Berlin, a strong wind was blowing. Caught by the wind, the airship crashed to the ground four or five times and then ascended. The vessel then drifted for some two hours, during which the mechanics managed to get the engines working, and the captain took the vessel once more over Staaken. Deeming it prudent not to attempt to land in the dark, the captain allowed the airship to drift, and eventually decided to bring it down on the dwarf fir trees at Creuchen, between Magdeburg and Stendal. All the passengers and crew, altogether about 30 persons, were rescued safely, but in the smash at Staaken, one of the spectators was killed, and about half-a-dozen injured.



AIRSHIP ENGINEERING PROGRESS IN THE UNITED STATES

By J. C. HUNSAKER, Eng. D., Commander, Construction Corps, U.S. Navy

(Continued from page 1427.)

Balloon Fabrics

FABRICS for balloons and airships usually consist of cotton cloth coated with rubber. The requirements are high strength, light weight, low diffusion, water resistance and durability. The latter is the most important desideratum, and from extended observations it would appear that the life of a rubberised fabric varies inversely with the intensity and time of exposure to sunlight. Attempts to devise an accelerated test using artificial ultra violet light, have led to the conclusion that, while such light causes deterioration, the greatest rate of deterioration occurs on exposure to direct sunlight accompanied by high humidity and temperature. The Bureau arranged at the beginning of this work to have the Bureau of Standards put in testing facilities. At first, the Bureau of Standards was used as a check on the fabric-testing apparatus at contractors' works, but very soon the chemists of the Bureau of Standards began to contribute valuable suggestions for improvement, and at the present time are conducting research to develop better material.

A study of British and other foreign practice in fabric manufacture, combined with the results of extended exposure tests carried out under various climatic conditions with fabric made experimentally in this country for the purpose, has now led to the adoption of what is believed to be a marked improvement in rubberised fabric.

The cloth is very carefully inspected after manufacture, both before and after such treatments as desizing and washing. All slubs and imperfect spots are marked so that they may be cut out before rubberising. In the rubber factories the cloth is first passed through spreading machines, where thin coats of dough (rubber cut with absorbed naphtha and similar volatiles) are applied. Carefully selected pure up-river Para gum is used for this purpose, and there is added only a very minor percentage of sulphur and litharge without the usual organic cure accelerators previously used. This thin rubber solution fills up the interstices of the weave. Much heavier rubber dough is then applied on the spreading machines as the process proceeds. After 20 to 25 coats are spread and dried, a continuous, gas-tight film is produced.

The gas-tightness depends, however, upon such factors as the thickness of the rubber proofing and the count of the cloth: high count cloth and heavy proofing giving the minimum diffusion. For instance, with two-ply BB cloth having a gas film of from $3\frac{1}{2}$ to 4 ozs., there is obtained very low diffusion. Added weights of proofing applied to higher count cloth would probably produce but slightly better results than are obtained with the above construction. Two plies of the treated cloth are stuck together by means of roll-ply machines. The fabric is then wound on drums, wrapped and steam-cured at carefully controlled temperatures and pressures.

Over-vulcanisation results in a fabric that ages rapidly, becoming brittle and stiff upon exposure. Examination of such fabrics upon exposure invariably shows high diffusion and rapid rise in acetone extract (indicating great oxidation). An acrid smell is always observed, and the rubber between the plies is hard, and shows a lack of its original adhesive properties. Under-vulcanisation is, therefore, the lesser evil, since exposure to the air and sun causes a certain degree of auto-vulcanisation.

Yellow and red organic dyestuffs soluble in naphtha are often added to the proofing gum. These dyestuffs become thoroughly incorporated throughout the rubber solution, and act as light screens in preventing the admission of sunlight to the rubber proofing. Yellow cadmium sulphide pigment is also used for this purpose.

The exterior surface of the fabric is coated with pure gum rubber dough containing usually a substantial proportion of litharge, which has been found to act as a screen or filter in preventing the admission of light rays to the rubber proofing. To the same exterior dough coating a quantity of finely

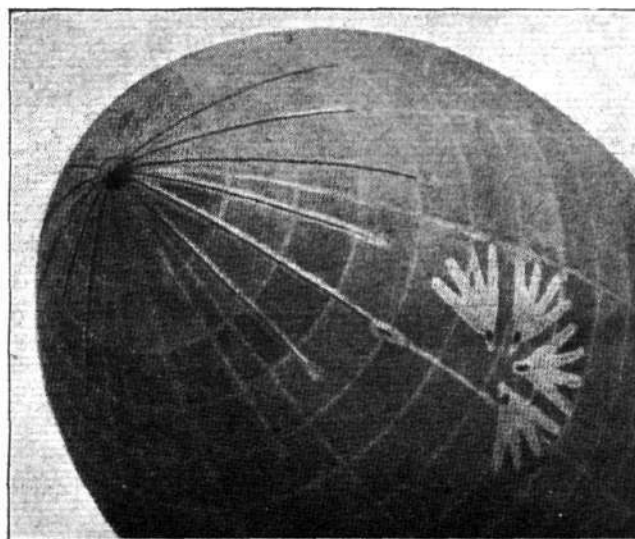
divided aluminium powder is added, and then spread as the outer facing. The principle of this is to provide a continuous, light-reflecting coat. Fabrics made with such a coating have proved to be efficient in this respect, remaining usually 20° to 30° Fahr. lower in temperature than similar fabrics without the aluminium facing. This aluminium coat is usually applied either with a spreader or a calico printing roll. In the latter case a larger number of coats are usually necessary on account of the thin character of the solution required for successful printing.

The inner or gas side of the fabric is coated with from $\frac{1}{2}$ to 1 oz. of pure rubber, which helps to keep the cloth fungus and moisture-proof, reduces diffusion, and makes a good sticking coat for successful taping.

The exterior and interior seam tape is made fairly wide (2 ins. or 3 ins.), and contains a substantial amount of proofing. The exterior tape has an aluminium facing. Both tapes are now cut on the bias so that stretch may occur.

The seams in the envelopes of non-rigid airships constructed abroad are cemented with a pure gum cement consisting of solvent and fine Para-rubber only. A cement of this character is entirely satisfactory where the temperatures to which the envelope is exposed rarely reach 95° ; but it was found that with the high temperatures prevailing in the United States during the summer this cement could not be depended on. General softening occurred, and the strength of the seam was reduced to the strength of the sewing, which is far below the strength of the fabrics used in making the balloon. One contractor, to overcome this difficulty, introduced a certain amount of resin into the cement which acted as a hardening agent. Even this was apparently insufficient, for when heated in an oven to a temperature of above 100° Fahr., the seams made with this cement showed a tendency to slip on account of the softening of the cement. Another contractor who had accepted the European practice of using a strictly pure gum cement encountered great difficulties with the earlier envelopes on account of the softening of cement. He investigated this problem very thoroughly, and finally developed a method of applying the pure gum cement with a semi-curing solution, with the result that the seams apparently hold up to temperatures of 130° Fahr. without softening. This practice is considered to be an important improvement.

The B class ships had envelopes made of doubled fabric, with the threads of the "bias ply" at 45° deg. to the threads



The nose of a C-type envelope, showing the stiffening wood battens and finger-patch suspension attachments.

of the other. The bias ply is necessary to prevent tearing, but is rather uncertain strength. It does help to take shear, however. Recent experiments with a three-ply fabric of which the middle ply only is bias are more encouraging, and indicate that we shall abandon the doubled fabric.

The three-ply fabric presents a remarkable degree of resistance to weathering. The aluminium surface, which keeps down the heat, is quite heavy, and is placed over a heavy outer film of rubber. Even though this complete outer film and the first layer of cloth and rubber should be broken down by exposure, there would still be two plies of fabric, with a heavy coating of rubber left to retard the diffusion of the contained hydrogen. It is through the use of high count cloth of low weight and high strength that the successful three-ply fabric can be produced, and the Bureau of Construction and Repair has consistently stimulated the production of this type of cloth. It is probable that present researches will result in the production of both ballonet and outer envelope rubberised fabrics of lighter weight, greater strength and lower permeability than even those that are now in use. For instance, some experiments with rubberised silk fabrics show that these fabrics can be made exceedingly light in weight, high in strength, and of very low diffusion, and that these characteristics are maintained after exposure even for periods of over 150 days, provided sunlight is shut out by a good aluminium outer coating.

After balloon fabric has been in service for periods of from three months upward, changes may take place in the rubber compounds that are used for proofing that cause increased permeability to be shown. These results are more common in fabrics exposed under moist conditions, especially in hot climates where there is a maximum sunlight, and is generally observed on fabric that is over-vulcanised or that contains insufficient proofing.

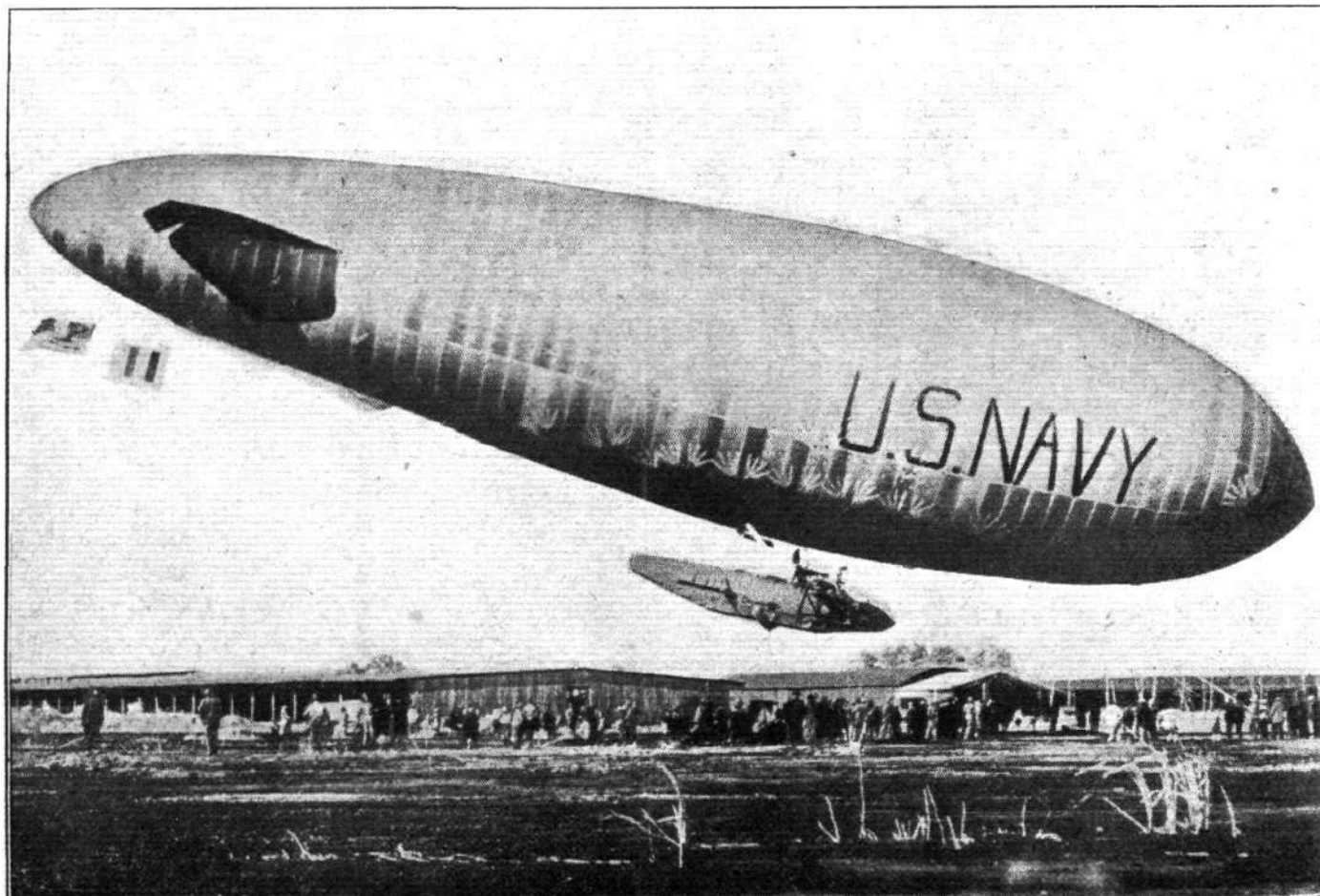
In the early days of the War the British had considerable trouble with the fabric used in their airships, and finally decided to reduce the diffusion through the use of a cellulose coating known as Delta Dope. Very good results were obtained with this, and it was used to some extent. Later on, in view of the poor results that were obtained with early American airship fabric, a material similar to that which the British used was developed by the Bureau and used with success. This dope was different in its composition and

action from that used for coating wings of aeroplanes. The latter material is used to shrink the cloth. Airship dopes contain a special form of cellulose nitrate of a higher degree of nitration, and are made soft and pliable by the addition of castor oil, which prevents the tautening effect when applied to fabric. These dopes when applied dry rather slowly and leave a film that is soft and highly resistant to the diffusion of hydrogen. It is customary to apply two coats of clear dope and two or three coats of the same dope containing about 10 or 15 per cent. of aluminium powder. For application of the dope a portable spraying outfit of the extension-rod type was obtained by the Bureau for air stations. It was found possible with this apparatus and a small crew of men to apply one coat of dope to a 85,000 cu. ft. envelope in one day. Because of this fact the operation of the airship was held up very little, the doping being done on rainy days.

Previous to doping, an airship at Rockaway had given very unsatisfactory results, showing a daily loss of 1.18 per cent. After doping the daily loss was only .08 per cent. hydrogen. Moreover, this airship continued in service for a period of six months after doping without showing high diffusion. Experience has shown that an airship which has a probable life of only six weeks could by doping be put into service again so that it would have an additional life of at least six months. It was also found that the aluminium dope had a tendency to keep the gas in the envelopes at a more uniform temperature. This, of course, would make the ships much more stable on account of the lessened expansion and contraction of the gas. In another instance a ship which had been in service for only a month undoped was giving unsatisfactory results, and was showing a daily diffusion of 4.47 per cent. When the ship was doped by brush with three coats a diffusion test showed a loss of only one-fifth of one per cent. daily.

Leakage of Helium

To determine the comparative permeability of various fabrics to helium and hydrogen, the Bureau of Construction and Repair forwarded to the Bureau of Standards a quantity of helium and a number of fabrics of special construction, including rubberised fabrics such as are used for the envelope of non-rigid airships, and fabrics such as may be used for the gasbags of rigid. It was found that the helium



The U.S. Navy C-1 dirigible, with twin engines

permeability was from 59 to 64 per cent. of that shown for hydrogen, and that a somewhat similar result was shown for the rigid fabric. The use of helium in airships of the future has been very much advertised, and the advantages of a non-inflammable gas are obvious. However, difficulties of supply render it necessary to devise ways to employ it with less loss than present hydrogen practices involve. The leakage through fabrics is less than with hydrogen, but the difference is not of great importance. The great bulk of gas now lost goes through the safety and manœuvring valves. It may be possible to rework helium that has become mixed with air. When the hydrogen in an envelope gets 20 per cent. of air in it, it is explosive and is promptly discharged.

Researches have been made by the Bureau into the causes of mildew which has been observed upon cordage and fabric shipped from France and stored in a warm place under humid conditions. Wherever the mildew is found the rope and fabric have become rotted and unsafe. In the investigation, mildew spores were scraped from the surfaces and incubated on agar agar. The growths that were produced were identified as green penicillium and black aspergillus. Mould cultures were then used in treating samples of various kinds of fabric and hemp rope after the fabric and rope had been brush-coated with various chemicals which might have an inhibiting action upon the growth of the mould. It was found that a dilute solution of ammonium phosphate containing a small quantity of sodium benzoate, or a very dilute solution of bichloride of mercury, could be used with entirely satisfactory results. American practice is to coat both inside and outside surfaces of fabric with rubber so that mildew cannot attack the cotton. We also use wire cable for suspensions, and are therefore more concerned with rust than mildew on important members.

Parachutes

All airships as well as kite-balloons are provided with parachutes to permit the crew to abandon ship in the air in case of fire. Fortunately, there has not yet been occasion to use the parachutes except in practice. It is believed, however, that if a fire does start there is some danger of the parachute catching fire before it gets away clear.

Feeling that it would be desirable to render fire-resisting the silk that is used in the construction of parachutes, experiments were conducted with various salts, and it was found that impregnation with 10 per cent. solution of ammonium phosphate gave successful results. The silk after treatment is dried and then formed into parachutes in the regular manner. The silk thus produced is resistant to flame, and when ignited ceases to burn almost instantly. Ageing tests have been made with cloth treated with ammonium phosphate and placed in an oven at high temperature for several days. These conditions failed to lower the strength of the fabric.

Suspension Systems

Practically all non-rigid airships which had been built up to the outbreak of the European War had what is known as a band suspension; that is, the lines carrying the weight of the car ran up to a band of strong, heavy fabric, which extended in a continuous line around the envelope. This band was located so that the lines reached the band at about the points where they became tangent to the envelope. As no portion of the band could take a very great load, such a suspension meant that each line from the car had to be sub-divided again and again so as to distribute the load into the band at very close intervals. There was thus produced a very large number of small lines close to the envelope, which greatly increased the power required to drive it through the air.

Early in the War the British Admiralty developed a much simpler and neater suspension, using the so-called Eta patch. An improved patch developed independently by the Goodyear Co. is used on all American airships.

In our suspension steel wires are used, running up from the car to a patch on the envelope, which consists of four tapering "fingers" radiating from the point to which the suspension wire is attached. Each finger consists of a strip of fabric extending outward from a central portion, from which two loops of manila rope project, to receive the thimble of the suspension wire. Under each finger is cemented to the envelope an extension of one end of a loop, which has been frayed out and impregnated with rubber. Each end of the loop thus distributes its load into the envelope throughout the entire length of the finger, and the two loops, having four ends, give four fingers. This construction provides for a very wide distribution of the load from each suspension wire.

As a result of the use of the patch suspension, it has become possible to make the entire car suspension of steel wire

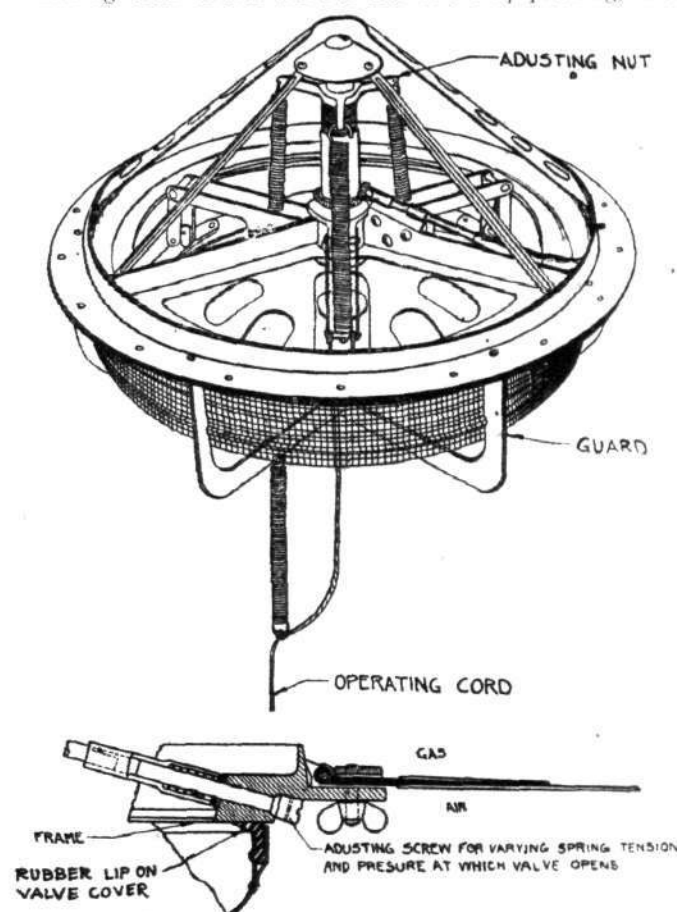
cable, reducing the number and diameter of all suspension lines. This reduction in the amount of cordage in the neighbourhood of the envelope has resulted in a considerable increase of speed.

Fins on airships constructed abroad are of the flat, externally-braced type, in which the fin is stiffened by a series of king posts and wire struts, all on the outside of the fin, and, consequently, giving a considerable amount of resistance. We introduced at the very beginning of our airship building a fin which is entirely internally braced—that is, its internal structure is such that it requires no external king posts or bracing wires. Naturally, this fin is considerably thicker than the European type of fin, but apparently is just as efficient as a control surface and weighs no more for unit area.

Valve Construction

Earlier valves on our non-rigids were of a most simple type of construction, resembling the valves used abroad, and their tightness was nothing to be proud of. The problem of tight valves and certainty of operation was attacked by Mr. John Gammeter, of the Goodrich Co., who produced an entirely original valve, which it is believed has no superior. (See accompanying sketch.)

The tightness of this valve is due to the lip packing, which



Sketch of one of the Gammeter valves, designed by Mr. John Gammeter of the Goodrich Co.

is carried by the cover of the valve, but when the valve is closed rests on a solid metal ring forming the frame of the valve. It extends toward the inside of the valve, gradually thinning to a knife-edge, and is made of soft rubber. In consequence, when the pressure comes on the valve the tendency is for the tip of this gasket or lip to press more and more firmly against the metal seat as the gas pressures increase.

The ideal valve for an airship should remain tight until the pressure at which it is open has been reached, and it should then open wide and remain so until the pressure has decreased below the point at which it should open, whereupon it should close tightly. This valve very nearly meets these requirements. The arrangements of the linkage which carries the valve cover is such that the extension of the springs required to allow the full opening of the valve is very small. Consequently, the tension in the spring remains very nearly constant, and the ideal is very closely approximated.

In the first ships constructed by the Goodyear Co., the operation of the safety valves was controlled by a cord which extended across the diameter of the envelope, attaching together two valves, one on each side of the envelope. The

theory was that when the pressure reached a certain amount, the sides of the envelope would be forced apart to a sufficient extent to produce a pull in the cord, causing the valves each to open and to remain open until the pressure fell sufficiently to allow them to close. The system works very well, but is difficult to keep in adjustment.

Present valves depend entirely upon internal pressure for their operation, and open outward like a pop safety valve. All valves may also be operated manually. The present approved arrangement of valves is to have one at about the mid-length of each side and one at the tail of the envelope clear of the fins. The two side valves act as safety valves, and are used for manœuvring only when both engines are stopped and a free balloon landing is necessary. The tail valve is the manœuvring valve for use under ordinary circumstances, so that the escaping hydrogen is well clear of fire from the engines.

[In addition to these B class airships, a few others of similar design, but with such modifications as the fitting of a "pusher" power plant in place of the tractor type, were apparently put into service, and we give illustrations of two types of these craft, the F 1 and the A 4 or E type. The latter was designed completely by the Goodyear Co., and the following brief particulars of this ship may be of interest.—Ed.]

The length of the envelope is 162 ft., the maximum diameter 33 ft. 6 ins., and the capacity 95,000 cub. ft. The car is 18 ft. long, and is equipped with a 150 h.p. Thomas engine. Seating capacity for six is provided, but the regular crew generally consists of three or four. The ship was designed to have a cruising radius of approximately 12 hours at full throttle, or longer at lower engine speed. The speed with full load is 56 m.p.h. Parachutes are mounted on the underside of the car. The pontoon gear, which can be seen in the illustration, provides a cushioning effect in landing, and also permits a landing to be made on water.

For over-water flying an ingenious arrangement is provided whereby the necessity of releasing gas as the weight of fuel decreases is avoided. This is accomplished by bringing the ship down to about 50 to 100 ft. of the surface of the water and lowering a hose, at the end of which is fitted a water-ballast pump. This is allowed to pass over the surface of the water which causes the pump to rotate and thus force water up the hose into the ballast tank until equilibrium is maintained. Longitudinal balance of the airship is controlled by shifting air in the ballonets.

The blower arrangement for forcing the air into the ballonets consists of a small Sturdivant fan driven by an electric motor, for emergency, and by slipstream air scoop under normal conditions. Finger-patch type suspension is employed.

(To be continued.)

Handley Page Machine in Athens

A HANDLEY PAGE machine, piloted by Capt. W. Shakespeare, arrived at Athens on October 30, after a journey by stages from London. The machine is visiting Greece, for the Aviation Exhibition in Athens. Bad weather delayed the progress of the machine, and during its flight down the Italian coast from Pisa to Rome, it encountered a severe wind storm which threatened to divert its course over the Mediterranean. The stages of the journey were London-Paris-Lyons-Gulf of Genoa-Pisa-Rome-Benevento-Taranto-Athens.

The Effects of Altitude

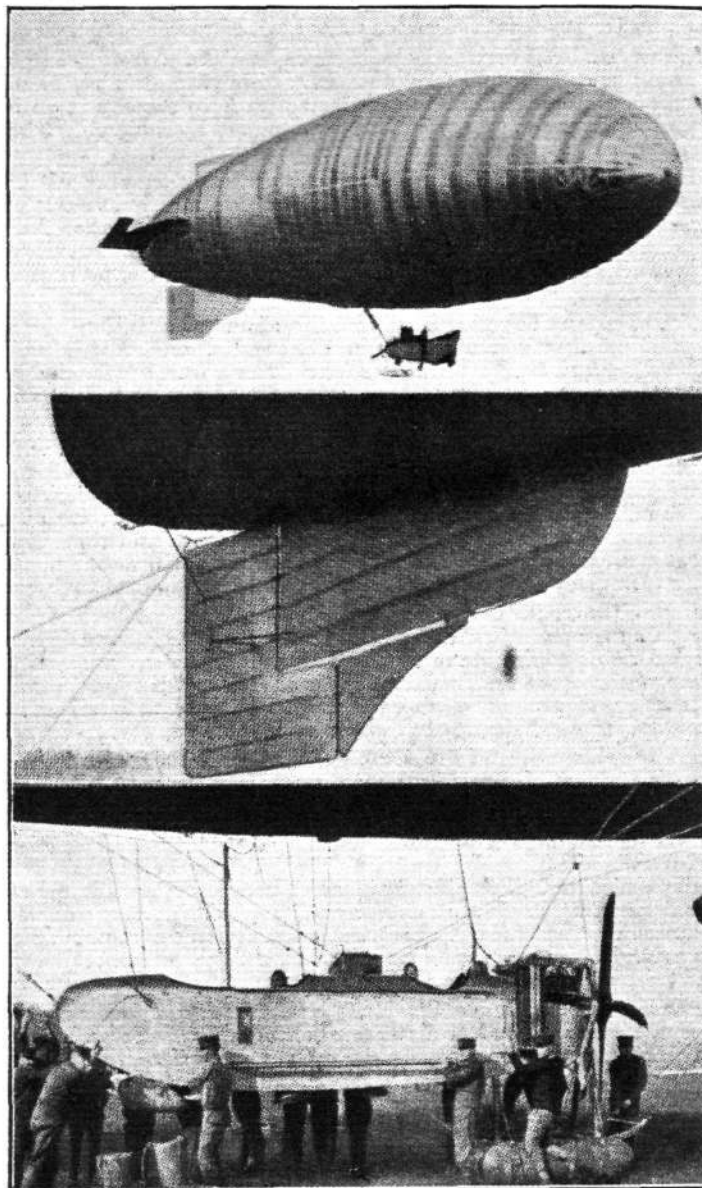
At the next meeting of the Royal Aeronautical Society to be held at the Royal Society of Arts on Wednesday, November 12, at 8 p.m., Dr. Chas. Atkin Swan, L.R.C.P., M.R.C.S., M.B., Ch.M., will give a lecture on "Some Physical and Psychical Effects of Altitude." The chair will be taken by Sir W. Arbuthnot Lane, Bart., C.B., F.R.C.S.

War Risks Office Closed

THE War Risks Insurance office at 53, Cornhill, E.C., has been closed, and all correspondence relating to the business of the office, including any business connected with the Air Raid Compensation Scheme, should now be addressed to the War Insurance Accounts Branch, Board of Trade, Gwydyr House Annexe, Whitehall, S.W. 1.

Avros at Windermere

It has been decided to keep the Avro seaplane station at Bowness open during the winter. In addition to taking up passengers, Capt. Howard Pixton is prepared to train a limited number of pupils during the winter. It would be



Another "pusher" modification of the B-Class, the A-4, with detail views of the tail and car

a distinction for any pupil to learn to fly from such an instructor, as Capt. Pixton is probably the *doyen* of all pilots now regularly flying. His own flying ticket dates from 1910, in which year he joined Mr. A. V. Roe and went with him to America. Those were the days of early experiment, before the Avro had earned the reputation for reliability which it now enjoys. Capt. Pixton won the Schneider Cup in 1914, and has also won many other prizes for flying contests.

London-Paris 'Plane Mishap

WHILE piloting a relief machine from Paris on the afternoon of October 29, Lieut. H. Shaw was compelled, owing to the adverse weather, to come down in mid-Channel. He alighted alongside the small coasting steamer *Harlech*, which took him and his passenger, Mr. Oelrichs, on board and also salvaged the express parcels which were in the cabin of the machine. The flotation gear, as fitted to all Airco machines, which had its first practical test, proved reliable in a very rough sea, but owing to the darkness it was found impossible to save the machine. Lieut. Shaw's parcels were duly passed by the Customs at Weymouth, and forwarded to London immediately by train.

The Customs and Aviation

AN interesting sign of the times is to be found in the London Customs Bill of Entry, which now contains in its import columns details concerning goods brought into Great Britain by air. A recent issue announces the fact that the Handley Page Transport Co., Ltd., have imported from France quantities of silk, fancy goods, ladies' hats and embroidery. These commodities were carried from Paris to Hounslow by the two-engined Handley Page aeroplanes engaged on the cross channel service.

AIRISMS FROM THE FOUR WINDS

LORD FISHER in *The Times* :—

"It's as clear as daylight that future war at sea absolutely precludes the use of any vessel of war that can't go under water, because aircraft will compel it. So why keep any of the present lot?"

"Not only that, but you've got also to scrap all the admirals and superior officers because they won't do for the new job. Put them all in some museum—like Greenwich Hospital (keep the submarines and Co.)."

"All you want is the present naval side of the Air Force!—that's the future Navy—only costing a few millions!"

POINTS upon the same theme from Sir Percy Scott's book :—

"Aeroplane pilots will be as numerous as taxi-drivers, and get about the same pay."

"The battleship waddles along at 20 miles an hour, and cannot waddle very far."

"It takes a battleship weighing 30,000 tons to carry 100,000 lbs. of this explosive."

"Ten aeroplanes weighing about three tons each would carry the same amount, so the relative weights of the carriers is as 30 tons—30,000 tons."

"When the battleship nears the end of her coal or ammunition she must waddle home. The aeroplane does not waddle home, but comes back at 100 miles an hour."

"The battleship is dead. The future is with the aeroplane."

A FEW years hence these forecasts will be still more emphasised by advances in scientific research outside aviation, but directly influencing and tending towards the greater use of aircraft. Already we have wireless communication

and wireless direction finding, which are such elements in rendering the safe navigation of the air but a matter of time, and now, according to the Paris *Excelsior*, M. Abraham, a French scientist, and Gen. Ferrie have introduced an improvement in wireless telephony which it is confidently asserted will, within a short time, make it possible to 'phone from these shores to the United States!

Looks like scrapping the lot of War theories hitherto prevalent.

AGAIN France leads us in officially recognising aeroplanes as regular mail carriers. The French Postal Authorities have informed the Compagnie Générale Transaérienne, the agents of the Airco Co. in France, that Airco machines will now be allowed to carry mails. The rate will be 3 fr., plus the ordinary foreign postage rates. The latest hour at which letters can be posted in Paris is 11 a.m. Letters will be distributed by special messenger at both ends.

WONDER when our G.P.O. will fall into line.

It must have been a novel experience for the Basuto chiefs when last week they took their half-hour flights over London from the Central Aircraft Co.'s aerodrome at Northolt. But we fancy that even more surprising to them was, later in the day, their sitting in front of a cinema stage and seeing their own flight reproduced on the screen.

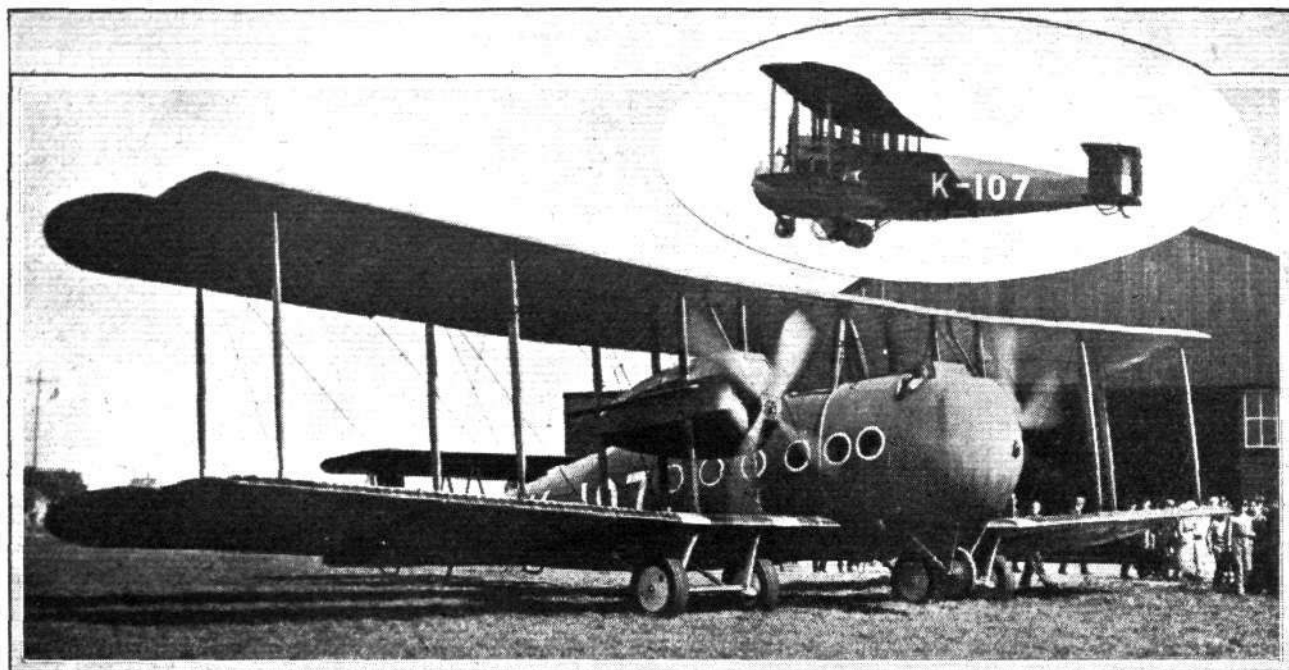
How's this for a high-flying record, even for so distinguished a flyer as the Italian patriot poet :—



A "RARA AVIS"

(Parliament announces that the demobilisation of the W.R.A.F. is now practically complete)

A Wraf-Bird was recently seen in the vicinity of one of our aerodromes. This species is fast becoming extinct



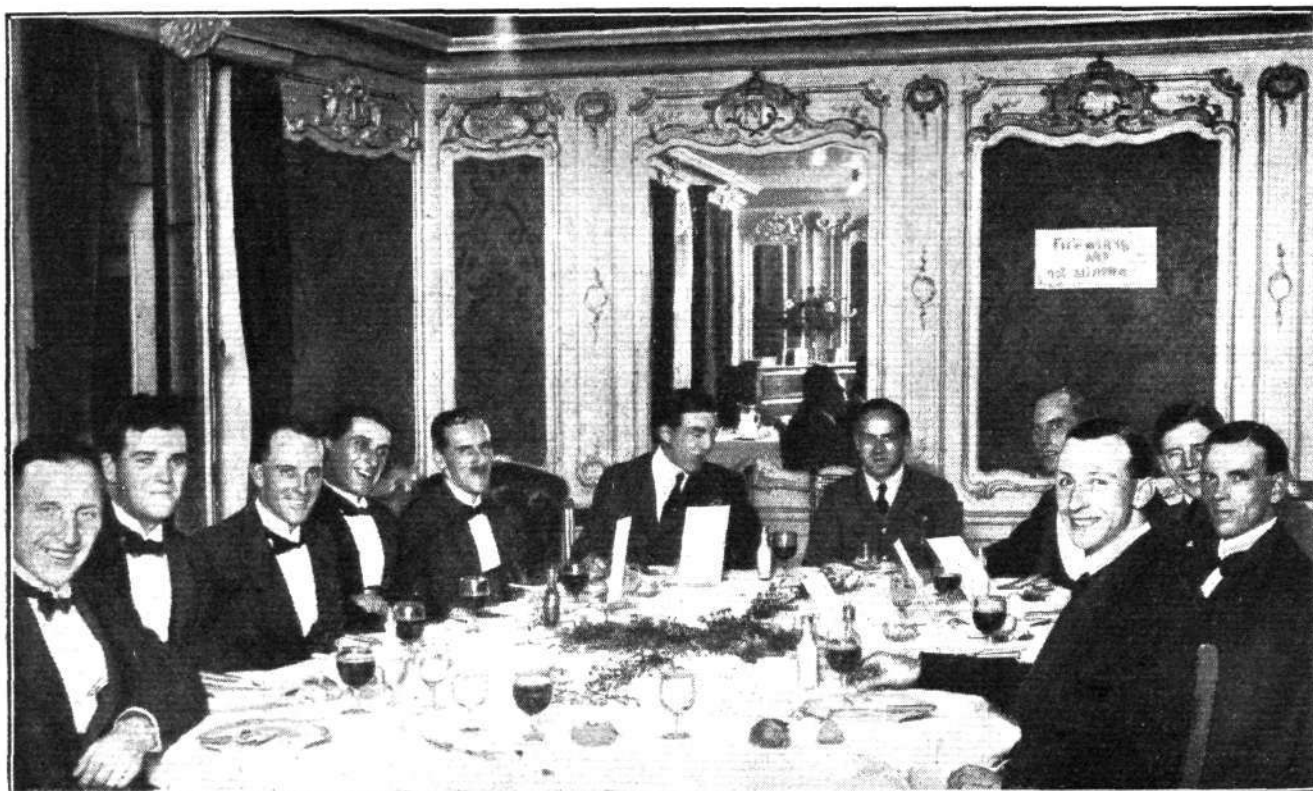
"VICKERS-VIMY COMMERCIAL" AEROPLANES FOR CHINA: One of 100 of these machines ordered from Messrs. Vickers, Ltd., by the Chinese Government, to be used for commercial aeroplane services in China. The speed of the machine is 100 m.p.h., and it has a carrying capacity of 16 passengers and one pilot, or 1½ tons of mails or goods, with an endurance of 5 hours. Our photograph shows one of these machines at the E.L.T.A. aerodrome at Amsterdam. Inset shows the machine in flight

"From the indomitable Sinn Feiners of Ireland, from the Red Flag which in Egypt unites the Crescent and the Cross, all insurrections levelled against the devourers of raw flesh are about to blaze up, lighted by sparks flying from us to them."—D'Annunzio.

RESCUING by aeroplane is no new war feat. But an attempt by a party of the R.A.F. of quite a novel saving stunt is reported from Winnipeg. It appears that Mr. J. B.

Tyrrell, the geologist and explorer, who has been surveying holdings in the Rice Lake district, Ontario, has in consequence of the early start of winter, got snowed in. In consequence, the R.A.F. party has set out to "retrieve" the scientist, and we shall hope in due course to be able to record the success of this little venture.

IN spite of the ravings of Hun-Bolshie sympathisers, Britain is still maintaining her honour by affording material



A TRANSATLANTIC FLIGHT REUNION DINNER: At the Café Royal a "family" dinner took place last month in connection with the flying of the Atlantic. The above snap was then secured, those present being (from left to right): Sir John Alcock, Messrs. Platford, H. G. Hawker, A.F.C., Mason, Fenn, Lieut. C. H. Biddlecombe, Sir A. W. Brown, Lieut.-Com. Mackenzie-Grieve, Messrs. Clements, Muller, F. P. Raynham

help, in the form of aeroplanes, tanks, etc., to the real Russian patriots to retrieve their country's disasters. The 90 millions or more which we have paid out to assist in bringing this section of the world into line with Peace would be cheap to civilisation in general if there were another o added. The menace of the Bolshie *must* be killed if the world is to continue to exist—whatever the Hun-Bolshies may desire. Admiral Cowan, in the Baltic, is one who is helping along the world's cause, and one form which his help takes is in propaganda work through airmen who have dropped bundles of proclamations from the Admiral, on the *Cronstadt*, which read: "Russian sailors, the British Fleet brings you bread and Peace. Do not fight against us. I guarantee the safety of everyone coming over to me; therefore I call on you to put your ships and guns out of commission. Come under the White Flag to negotiate. I do not want to fight with you. On the contrary, I will give you and your families Peace, security and bread."

WORLD competition still continues for qualifying to fill Jazz instructor positions at different "Palais de Dance" now coming to the fore. A Frenchman at Madrid appears to be well in the running for securing the next vacancy in one of these fashionable resorts, as he has looped the loop 624 times, as reported last week, in a flight of 169 minutes, close on 4 loops a minute! Looks as if the poor devil who in America previously held the record at a mere 455 loops must now turn his mind to some other less fashionable pursuit than jazzing.

THE writing on the wall:—Edinburgh Town Council has formally approved the tender of Messrs. Brown, Boveri and Co., of Baden, Switzerland, for turbo-alternators for Portobello power station, amounting to £106,618. The nearest British tender was nearly £70,000 higher.

Wm. Bruce Lindsay, of the Town Council, in proposing the acceptance of the Swiss tender, said, in the case of two contractors, they could not reduce their price at all. "A third intimated that as any reduction could not be more than 10 per cent., they had decided to adhere to their original figure." Mr. Lindsay, therefore, said the council could not give a premium of £70,000 for a machine of British manufacture. Sir Charles Parsons, one of the contractors, had stated that assuming he did the work without making any profit he could not look at the foreign offer.

Sir Charles does not, however, propose to let this practical demonstration be lost. He intends to post the particulars of the contract in a prominent place in his works where his workmen can read it.

The writing on the wall.

So according to Mr. Cecil Harmsworth, Foreign Under-Secretary, the Peace Treaty in all probability will be ratified on November 11, and come into force from that date. But the "End of the War" is not even then. Mr. Harmsworth says it does not mean that the "end of the War," as affecting contracts, will necessarily be on November 11. The "end of the War" for that purpose will be declared by an Order in Council.

To some, however, it may be comforting to know that the first meeting of the Council of the League of Nations must take place within 15 days of the coming into force of the treaty.

So we are getting on by degrees.

A CORRESPONDENT from Kensington writes as follows:—"I wonder whether any of your other readers have noticed the resemblance of the dial-springs in the photo. of the B. & P. controls on page 1419 of last week's FLIGHT, to two men's faces. I presume it is the dial-springs, not the face of the photographer." We have asked our photographer, and he says it's a slander action he'll start against anyone accusing those faces of being his.

AN endeavour is being made to divide the responsibility of an epidemic of falling ceilings in Camberwell between air raids and the vibration of motor omnibuses. From experience since the 44's started running through Great Queen Street we'll back the 'bus every time.

DAYLIGHT saving will *not* be continued next year in the United States. What about it here?

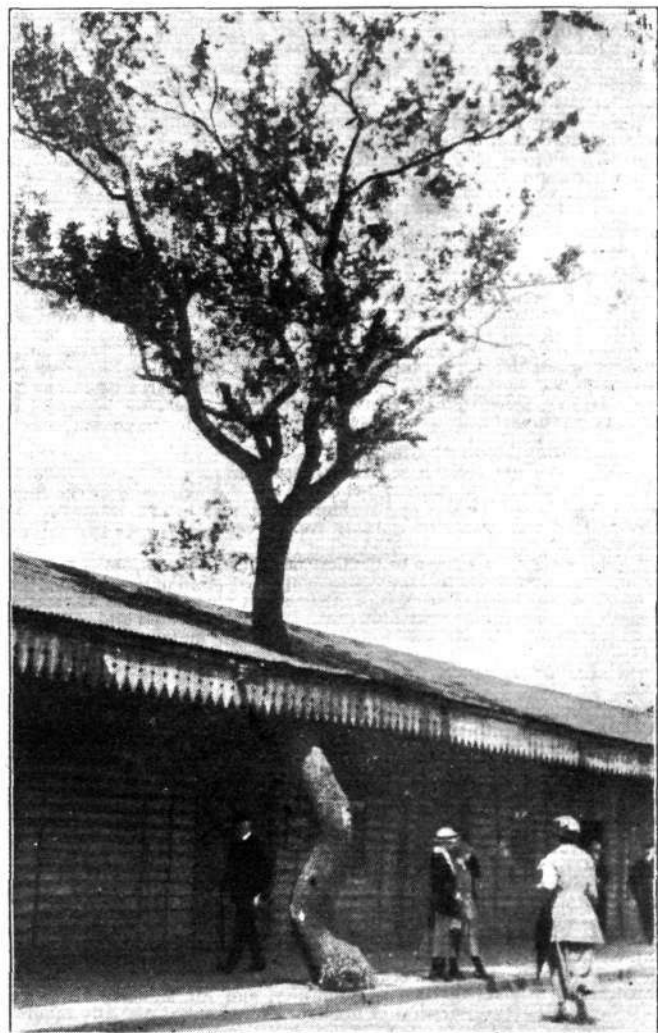
LADY SHELLEY-ROLLS sends us an interesting communication in regard to an allusion to an early attempt at flying in the reign of King Harold, son of Earl Godwin, which Lady

Shelley-Rolls thinks may interest students of the history of aviation. It is taken from the edition of Milton's History of England published in 1670, and includes the following paragraph:—

"In the meanwhile a blazing star, seven mornings together, about the end of April, was seen to stream terribly, not only over England, but other parts of the World; foretelling heer, as was thought, the great changes approaching; plainliest prognosticated by Elmer a Monk of Malmsbury, who could not foresee, when time was, the breaking of his own legs for soaring too high he in his youth strangely aspiring, had made and fitted Wings to his Hands and Feet; with these on the top of a Tower, spread out to gather air, he flew more than a Furlong; but the wind being too high, came fluttering down, to the maiming of all his Limbs; yet so conceited of his Art, that he attributed the cause of his fall to the want of a Tail, as Birds have, which he forgot to make to his hinder parts. This story, though seeming otherwise too light in the midst of a sad narration, yet for the strangeness thereof, I thought worthy enough the placing as I found it plac'd in my Authour."

LADY SHELLEY-ROLLS concludes by saying that "this quaint description of a flying experiment in Milton's History has only recently come to my notice. I wonder if many of your readers are already familiar with it?"

Extracted from another work, a reference to this passage has already appeared in FLIGHT, although not in the exact words of the above original. In May, 1915, page 386, Mr. J. T. Towson drew our attention to an article which had appeared in *The Science of Aerostation*, a tome dating back over one hundred years. In this volume the writer of an article had, amongst other references to early flying efforts, given a *résumé* of the above paragraph from Milton's History of England, but as this was not quoted word for word from the original, it is a point of interest that through Lady Shelley-Rolls we are now able to place the correct version on record.



No, the tree has not grown through the verandah. The "station" at Golders Green, so well known to the aeronautical world, was considerably built around Nature's specimen

AVIATION IN PARLIAMENT

Sales of German Aircraft

Sir F. HALL in the House of Commons on October 29 asked the Under-Secretary of State for Foreign Affairs if the German Government have been required to furnish particulars of all aircraft and air materials sold or exported since the Armistice; and to pay its value by January 31, 1920; if the Allies have any definite information that Germany has sold or exported aircraft or air materials to Sweden contrary to her undertakings; if so, why no practical steps have been taken sooner to prevent such action; and what means will be adopted to ensure that information furnished under this head by Germany in accordance with the requirements of the Allies will be accurate?

Mr. Harmsworth: This question is receiving the consideration of the Peace Conference, who are taking all the necessary measures on the matters raised by the hon. and gallant Member.

Sir F. Hall: Is the hon. gentleman aware that sales of aeronautical material have taken place in Sweden for and on behalf of Germany; who has received the proceeds of those sales; and has the Supreme Council of the Allies declared these sales null and void?

Mr. Harmsworth: Perhaps my hon. and gallant friend will give me notice of that question.

Sir F. Hall: Having put down certain specific questions why, in the circumstances, am I not entitled to get a full reply?

Mr. Harmsworth: My answer gives my hon. and gallant friend all the information I can give him.

Sir F. Hall: Which means none!

Royal Aircraft Factory, Farnborough

Sir W. JOYNSON-HICKS on October 29 asked the Under-Secretary of State to the Air Ministry how many men are now employed at the Royal Aircraft Factory at Farnborough; and whether any decision has been arrived at as to the future of such factory?

Mr. Hope: I have been asked to answer this question. The present strength of the personnel at the Royal Aircraft Establishment, Farnborough, is 2,339, of whom 237 are trade lads and 356 are women. Reductions in the staff are continuing, and it is anticipated that the strength will eventually be reduced to about 1,200. It is proposed that the factory shall be used in future as an experimental and research establishment for the investigation of aerodynamical and aero-engine problems.

Aircraft Production and Inspection Departments

Sir W. JOYNSON-HICKS asked the Under-Secretary of State to the Air Ministry whether the Aircraft Production Department and the Aircraft Inspection Department are still in existence; and what is the number of personnel and the cost of such departments, respectively?

Mr. Hope: The Aircraft Production Department, of which the Aircraft Inspection Directorate forms a part, is still in existence. The total headquarters staff is 1,932, the annual cost in salaries being £422,897. These figures include the staffs of the three Directorates of Supply, Research, and Inspection, together with the Accounts Branch and other common services. The staff of the Aircraft Inspection Directorate alone numbers 300, of which the annual cost is £88,507.

The East Fortune Station

Mr. JOHN HOPE asked the Under-Secretary of State to the Air Ministry whether he can state the rate of expenditure at East Fortune Air Station since the Armistice; and what will be the estimated saving of money by the removal of this aerodrome?

Maj.-Gen. Seely: I am not clear what information my hon. friend requires. If he refers to capital expenditure, I am informed that the payments made for works, buildings, land, machinery and plant, etc., from the date of the Armistice to September 30 have amounted to £77,000. The cost of maintaining the aerodrome in peace time may be estimated at £29,000, but it is difficult to estimate the saving entailed in giving up the station in other directions, as that would depend on the amount of personnel and material transferred to other airship stations.

The No. 2 Northern Aircraft Depot

Sir W. JOYNSON-HICKS asked the Under-Secretary of State to the Air Ministry if he will state how many men are still employed at No. 2 Northern Aircraft Depot; and what are they doing?

Maj.-Gen. Seely: This repair depot is being closed down. The strength at present is 894, or 33 per cent. less than it was at the end of September. The strength will be reduced to a care and maintenance party by the middle of next month. Since October 15, when repair work ceased, the staff have been employed in clearing up and concentrating stores for disposal.

The Record Department, Blandford

Sir W. JOYNSON-HICKS asked the Under-Secretary of State to the Air Ministry if he can state how many girl clerks are now employed at the Royal Air Force record department at Blandford; whether special trains are still run from Bournemouth; and whether greater economy could be exercised in this work?

Maj.-Gen. Seely: In answer to the first part of my hon. friend's question, the number of women clerks and typists employed at Blandford on September 30, 1919, was 669. The reply to the second part is in the affirmative, and to the last part that all economy possible is being secured and the station reduced as rapidly as the needs of demobilisation in the way of records permit.

The Stores Depot, Milton

Maj. D. DAVIES asked the Under-Secretary of State to the Air Ministry if he will state for what purpose the Didcot depot is being used, and how many persons are employed there?

Maj.-Gen. Seely: No. 3 Stores Depot, Milton, near Didcot, is used for the storage of aeroplane spare parts, raw material, soft goods, and canvas hangars. The strength at the present time is 1,648, and it is intended to reduce this number by December 1 next to 1,221. This is one of the three stores depots which it will be necessary to retain for the R.A.F.

Ordnance Survey and Aerial Photography

Lieut.-Col. MOORE-BRABAZON asked the Under-Secretary of State to the Air Ministry what steps, if any, have been taken to use the experience obtained during the War in aerial photography for mapping purposes towards revising and helping in ordnance survey work in England, in view of the fact that so many maps are now out of date?

Maj.-Gen. Seely: As my hon. and gallant friend is aware, the Board of Agriculture is responsible for ordnance survey maps. A Committee, with representatives of the War Office, Admiralty, and Air Ministry have been considering the general question of maps, including those specially required for air purposes, for which, undoubtedly, aerial photography will be of the greatest value.

Central House, Kingsway

Sir W. DAVISON asked the Under-Secretary of State to the Air Ministry during Central House, Kingsway, which was commandeered by the Ministry when the War, will be restored to the various business firms who were previously in occupation, and who are hampered in re-establishing their businesses on a peace basis owing to the inadequacy of the temporary accommodation they have secured; what is the total rental value of the premises;

whether less expensive premises could be obtained for the Ministry elsewhere; what is the particular work being carried on on the premises; and what are the number of officials employed thereon?

Mr. J. Parker: Central House, Kingsway, will be vacated completely by the Government staffs now in occupation by the end of the year. The estimated total inclusive rental value is £7,618 per annum. The vacation of the premises will be effected by a reduction of the staff and by the removal of the remainder to less expensive premises. The work being carried on is design, research, and technical work generally in connection with aircraft production under the Ministry of Munitions. As regards the last part, the number of officials at present engaged in the premises is 208.

R.A.F. Stations.

Maj. LANE-FOX on October 30 asked the Under-Secretary of State for Air what is the present staff employed at the aerodromes at Tadcaster and Sherburn-in-Elmet, respectively; what has been the average monthly cost of these aerodromes during the past three months; what useful purpose they have fulfilled; and what is the policy of the Government as to their continued existence?

Maj.-Gen. Seely: At September 30, 1919 (the latest date for which returns are available), the number of staff employed at these stations was as follows: Tadcaster 242, Sherburn-in-Elmet 89. The average monthly cost during the last three months (July to September) has been £5,700 and £1,700 respectively. This has been greatly reduced during the present month. These stations are being utilised as headquarters for the storage of standard aeroplanes, and can be used for civil aviation purposes. They are to be closed down when the valuable stock now stored there has been evacuated.

Mr. R. Gwynne asked the Under-Secretary of State for Air what purpose the air station at Polegate is still being retained; when the airships were removed; how many men and women were employed there in June last; and how many are employed there at the present time?

Maj.-Gen. Seely: As the responsibility for lighter-than-air craft has now been transferred to the Air Ministry, my right hon. friend the First Lord of the Admiralty has asked me to reply to this question. The airship station at Polegate is being closed down. At the moment it is used for the storage of small airships and stores which are in course of transfer to the Disposal Board. As soon as these have been disposed of the station will be evacuated. The strength at the dates mentioned by my hon. friend was as follows:—

		June 30, 1919.	October 28, 1919.
R.A.F.—Officers	5	2	
Other ranks	24	22	
W.R.A.F.	15	—	
	44	24	

Four of the personnel (at October 28) are employed on meteorological duties at Beachy Head.

Route to Egypt Inquiry Committee.

Sir W. JOYNSON-HICKS asked the Under-Secretary of State for Air who are the officers making inquiry into the recent losses on the Egypt route, and if evidence is being taken on oath?

Maj.-Gen. Seely: The members of the Committee of Inquiry referred to are as follows:—

President: Air Vice-Marshal E. L. Ellington, C.B., C.M.G., C.B.E., Director-General of Supply and Research, Air Ministry.

Mr. G. B. Cockburn, O.B.E., Head of the Accidents Branch of the Department of the Controller-General of Civil Aviation, Air Ministry.

Air Commodore H. R. M. Brooke-Popham, C.B., C.M.G., D.S.O., A.F.C., Director of Research, Ministry of Munitions.

Air Commodore A. R. Borton, C.M.G., D.S.O., A.F.C.

The last-named officer has had great experience of the work to be investigated by the Committee. He has flown in a Handley-Page machine over the route to India and has surveyed part of the route on to Australia. The Committee is not taking evidence on oath.

East Fortune Airship Station

THE EARL OF WEMYSS, in the House of Lords on October 30, asked the Government whether they could explain the reasons which had decided the Government to do away with the East Fortune Air Station; whether they could explain the advantages possessed by the Yorkshire site to which it had been decided to transfer the East Fortune Air Station; whether they could give the total amount of public money which had been spent on this station since its inception; and, further, whether he would state what proportion of the expenditure had been incurred since the Armistice, and at what date the last payment was made or liability incurred for work of any kind on this station; and moved for papers.

The Marquess of Londonderry assured the noble earl that the Air Ministry were fully alive to the necessities of economy, and reminded him that their programme had been most rigidly and, in the matter of airships, most ruthlessly cut down. At the date of the Armistice there were 16 airship stations in the United Kingdom. The Admiralty originally intended to retain four rigid airship stations, but in view of the necessity of greatly reducing the programme it was decided that only one station should be retained. Howden would accommodate two ships of the "R. 38" type and one of the "R. 34" type, whereas East Fortune could accommodate only one ship of the "R. 38" type. Moreover, Howden was more suitable for the airships which they were entitled to contemplate for the future; and the atmospheric conditions for navigation were better at Howden than at East Fortune. The huts and sheds at Howden were of a semi-permanent type. To substitute permanent structures would cost £60,000, while to transport the airship sheds at Howden to East Fortune would cost £250,000. The total amount of public money spent on East Fortune from August, 1916, to September 30, 1919, was £567,700. There were still outstanding liabilities on account of contractors' claims and balances of accounts which were estimated at £35,000. It was anticipated that these claims and balances would be brought to a close at a comparatively early date. Of the total expenditure of £567,700 on East Fortune, the sum of £77,330 had been paid since the Armistice. A certain amount of that payment was due to commitments before the Armistice. All these aerodromes had a potential value for liquidation purposes. No one could say definitely that none of these aerodromes would be made use of for the purpose of commercial aviation or similar undertakings.

Earl Wemyss thanked the noble Marquess for the information he had given the House, and withdrew his motion.

R.A.F. Permanent Buildings

REAR-ADMIRAL ADAIR on November 3 asked the Under-Secretary of State to the Air Ministry whether any permanent buildings are being, or are to be, erected for the Royal Air Force; and, if so, what expenditure of public money is entailed thereon?

Maj.-Gen. Seely: It will be necessary to erect permanent buildings in substitution for hutting or temporary buildings at such air stations as are retained for the after-War Air Force. The number of stations so to be maintained is now under consideration, and I cannot, therefore, give the estimated cost at present.

THE ROYAL AIR FORCE

London Gazette, October 24

The classification of Maj. H. J. Newton-Clare, O.B.E., is "T" and not "S.O."; of Capt. F. Workman, M.C., "T" and not "A."; of Capt. K. R. Park, M.C., "A" and not "T."; of Capt. W. P. Groves, "S.O." and not "T."; of Capt. G. L. Hunting, "S.O." and not "T."; of Capt. A. A. B. Thomson, M.C., "A." and not "S."; of Lieut. J. M. McEntegart, "S.O." and not "T."; of Lieut. H. C. Pyper, "S.O." and not "Ad."; of Lieut. H. O. Long, "O." and not "Ad." as stated in *Gazette* of Aug. 1.

The notification in *Gazette* of Sept. 5 concerning Capt. H. W. G. Jones, M.C. (A.), is cancelled. (The notification in *Gazette* of Aug. 1 is to stand.)

Staff Officer, 3rd Class (P.)—Flight Lieut. H. R. Kavanagh, M.B.E.; Oct. 15, vice Flight-Lieut. H. H. Clarke.

Flying Branch

Light-Lieut. J. A. Hartcup to be Flight-Lieut. (A.) from (S.O.); Sept. 10. Flight-Lieut. (actg. Sqdn.-Leader) N. G. Stewart-Dawson, D.S.C., relinquishes the actg. rank of Sqdn.-Leader on ceasing to be employed as Sqdn.-Leader (A. and S.); Oct. 15.

Pilot Officer J. L. Airey to be Flying Officer; Aug. 7.

The following relinquish their commns. on ceasing to be employed:—Sec. Lieut. C. Maddox (Sec. Lieut., Welsh R.); July 14. Lieut. (Hon. Capt.) O. M. Greg (Capt., R. War. R.); Sept. 18. Lieut. E. J. Dease (Sec. Lieut., Rif. Brig.); Lieut. M. Tod (Lieut., Black Watch), Sec. Lieut. (Hon. Lieut.) C. R. A. Wallis (Lieut., R.G.A.); Oct. 8. Capt. W. McKay (Lieut., Sea. Highrs.); Lieut. F. Coxen (Lieut., R.F.A.); Oct. 13. Lieut. R. S. Butler (E. Surr. R.); Oct. 14. Capt. C. Gordon-Davis (Capt., N. Staff. R.); Maj. A. P. Pargiter, M.C. (Capt., R. Ir. Regt.); Oct. 15.

(Then follow the names of 84 officers who are transfd. to the Unemployed List under various dates.)

Lieut.-Col. Hon. C. M. P. Brabazon, O.B.E. (Maj., Irish Gds.) relinquishes his commn. on account of ill-health contracted on active service; Oct. 22.

Capt. S. H. Long, D.S.O., M.C. (Lieut., Durh. L.I.) resigns his commn. and is granted the rank of Maj.; July 31 (substituted for notification in *Gazette*, Aug. 6).

Lieut. H. A. Miller relinquishes his commn. on account of ill-health contracted on active service, and is granted rank of Capt.; Aug. 15.

Lieut. (Hon. Capt.) E. Fletcher (R.A.S.C.) (T.F.) relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain rank of Capt.; Oct. 6.

Lieut. D. Bonnard relinquishes his commn. on account of ill-health, and is permitted to retain his rank; Oct. 14.

Sec. Lieut. (Hon. Lieut.) T. A. Evans relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain rank of Lieut.; Oct. 15.

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—R. L. MacLeod (caused by wounds); Aug. 14. P. Evans (contracted on active service); Oct. 15. L. V. Nicol (contracted on active service); Oct. 16.

The notification in *Gazette* of July 18 concerning Sec. Lieut. H. G. Souchon is cancelled.

The notification in *Gazette* of July 29 concerning Sec. Lieut. R. Blanchard is cancelled.

The notification in *Gazette* of Aug. 12 concerning Sec. Lieut. W. A. Peggs is cancelled.

Administrative

Flying Officer A. Anderson to be Flying Officer, from (O.); Aug. 10.

Sec. Lieut. (actg. Capt.) J. W. Jones to be Lieut.; April 2, 1918, and to retain actg. rank of Capt. until April 30 (substituted for notification in *Gazette* of March 7).

Sec. Lieut. C. S. Broughton is graded for purposes of pay and allowances as Lieut. while employed as Lieut.; May 1.

Sec. Lieut. T. F. T. M. Williams (late Gen. List, R.F.C., on prob.) is confirmed in rank as Sec. Lieut.; July 2, 1918.

Sec. Lieut. (Hon. Lieut.) L. A. W. Knight relinquishes his commn. on ceasing to be employed; April 11 (substituted for notification in *Gazette* of June 3, wherein this officer was shown under Flying Branch).

(Then follow the names of 37 officers who are transfd. to the Unemployed List under various dates.)

Lieut. C. W. King relinquishes his commn. on account of ill-health, and is permitted to retain his rank; Sept. 28. Sec. Lieut. A. C. Baldwin relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; Oct. 16.

The notification in *Gazette* of April 8, concerning Sec. Lieut. W. Lee is cancelled.

Technical Branch

Capt. (Hon. Maj.) A. Crook is to be actg. Maj. while employed as Maj., Grade (A.); May 1.

Flight Lieut. C. F. Pallott to be Flight Lieut., Grade (A.), from (S.O.); Sept. 29.

Flying Officer L. T. Sanderson to be Flying Officer, Grade (A.), from (S.O.); Oct. 20.

Flying Officer J. W. Gardner relinquishes the grading for pay and allowances of Flight Lieut. on ceasing to be employed as Flight Lieut., Grade (B.); Oct. 13.

Sec. Lieut. F. G. Eckford is graded for purposes of pay and allowances as Lieut. while employed as Lieut., Grade (A.); May 1.

The following Sec. Lieuts. are graded for purposes of pay and allowances as Lieuts. whilst employed as Lieuts., Grade (B.); May 1:—F. Adams, (Hon. Lieut.) H. Allsebrook, R. Fell, H. Haworth, F. Hembley, (Hon. Lieut.) R. Kearton, C. H. N. Nunn, C. G. A. Poole, W. R. Tuddenham (substituted for the notification in *Gazette* of Aug. 19, wherein the above officers were shown as graded for purposes of pay and allowances as Capt. whilst employed as Capt., Grade (B.)).

Sec. Lieut. G. T. Godfrey to be Lieut.; June 3 (since demobilised).

Pilot Officer (Hon. Flight Lieut.) F. O. Sonderbye relinquishes the grading for pay and allowances as Flying Officer on ceasing to be employed as Flying Officer, Grade (B.); Oct. 11.

Pilot Officers to be Flying Officers, without pay and allowances of that rank:—H. J. Bagge, A. R. Caldicott, W. Morgan, G. V. Russell; Oct. 1.

(Then follow the names of 43 officers who are transfd. to the Unemployed List under various dates.)

Lieut. L. S. News relinquishes his commn. on account of ill-health (contracted on active service,) and is granted the rank of Capt.; Oct. 14.

Lieut. R. B. Ashcroft, M.C. (Lieut., Notts and Derby. R.) relinquishes his commn. on account of ill-health (contracted on active service); Oct. 2.

The surname of Sec. Lieut. J. B. Meikle is as now described, and not "Meike," as stated in *Gazette* of Sept. 22.

The notification in *Gazette* of July 29 concerning Lieut. P. N. Shone is cancelled.

The notification in *Gazette* of Oct. 21 concerning Sec. Lieut. (Hon. Lieut.) C. A. Assiter is cancelled.

Medical Branch

(Three officers transfd. to the Unemployed List under various dates.)

The initials of G. S. Marshall are as now described and not "G. F.," as stated in *Gazette* of June 3.

The surname of H. B. B. Greene is as now described and not as shown in *Gazette* of Aug. 29.

Dental Branch

Lieut. G. O. Roper to be Lieut., from (K.B.); June 22, 1918 (substituted for the notification in *Gazette* of June 28, 1918, in which he is shown under Medical Branch).

The following are granted temp. commns. as Lieuts.:—C. A. E. Cook; June 10, 1918 (substituted for the notification in *Gazette* of June 25, 1918, in which he is shown under Medical Branch). K. Batten; July 19, 1918, (substituted for the notification in *Gazette* of July 26, 1918, in which he is shown under Medical Branch).

The Christian names of Stanley Gordon Smith are as now described and not as shown in *Gazette* of Aug. 29.

Chaplains' Branch

Transferred to the Unemployed List:—The Rev. T. L. Beveridge; Sept. 2. The Rev. N. T. Hopkins, B.A.; Sept. 3. The Rev. E. C. Storr, M.A.; Oct. 11.

The notification in *Gazette* of Sept. 26, concerning the Rev. A. J. N. Saunders is cancelled. (*Gazette* of June 27 to stand.)

Memoranda.

The following temp. appointment is made:—Wing Com. R. Gordon, C.M.G., D.S.O., and to be actg. Group Capt. without pay and allowances of that rank whilst specially employed; Oct. 25.

P.F.O. E. Hobbs is granted an hon. commn. as Sec. Lieut.; May 30.

(Ten follow the names of 8 cadets granted hon. commns. as Sec. Lieuts. and 7 officers transfd. to the Unemployed List under various dates.)

The following officers have been granted short service commns. in the ranks stated, with effect from Oct. 24. They will retain their seniority in the substantive rank last held by them prior to the grant of the short service commn., except that officers gazetted to a rank lower than their previous substantive rank will be placed at the head of the list of officers of the rank to which they are now gazetted, and will retain seniority relative to each other in accordance with their previous position on the gradation list.

In the case of officers now gazetted Flying and Observer Officer from Pilot Officer, seniority will date from the date of *Gazette*.

Squadron Leaders.—H. G. Atkinson, O.B.E. (T.), E. M. Bettington, O.B.E. (T.), H. C. Fuller (A'ship).

Flight Lieutenants (from Squadron Leader).—J. R. Howett (A.).

Flight Lieutenants.—F. R. Alford, M.C. (T.), J. E. M. Atherley (Ad.), J. C. Atkinson (T.), V. H. Baker, M.C., A.F.C. (A.), C. B. Bumpfrey (A. and S.), H. G. Bowen (A.), T. G. Bowler (A.), W. S. Caster, M.C. (A.), F. H. Coleman (A.), N. R. Cook, D.S.C. (A. and S.), E. J. Cooper, D.S.C. (A. and S.), L. G. Le B. Croke (O.), B. C. H. Cross, D.F.C. (S.), C. B. Dalison, A.F.C. (A. and S.), R. E. H. Daniel (T.), G. G. Dawson (T.), E. E. Deans, D.S.C. (A. and S.), J. C. O. Dickson, D.F.C. (A.), J. L. L. Duffus (T.), G. H. Errington (Ad.), E. C. W. Fitzherbert, D.S.C. (T.), A. W. Fletcher, A.F.C. (A. and S.), W. E. C. B. C. Forsyth (S.), M. B. Frew, A.F.C. (D.S.O., M.C. (A.), S. Frost (T.), W. E. Gardner, D.S.C. (A.), T. R. Hackman (A.), E. St. C. Harnett, O.B.E. (S.O.), H. Hemmin, A.F.C. (A.), L. A. Hervey (A.), T. E. B. Howe, A.F.C. (A.), H. M. Ireland, D.F.C. (A.), H. C. Irwin, A.F.C. (A'ship), C. H. B. Jenner-Parson (A.), J. H. O. Jones (A.), F. C. Lander, A.F.C. (A. and S.), A. Latimer (T.), F. H. Laurence, M.C. (A.), A. S. G. Lee, M.C. (A.), A. L. Lingard (T.), W. H. Mackenzie, A.F.C. (A.), W. Man, D.F.C. (A. and S.), G. J. Monson-Fitzjohn (T.), A. D. Newbury (T.), T. H. Newton, D.S.C. (A. and S.), G. M. F. O'Brien, D.S.C. (A. and S.), A. H. Peck, D.S.O., M.C. (A.), A. R. T. Pipon, D.S.C. (S.), W. A. Powell (T.), E. R. Pritchard (A. and S.), A. D. Pryor (A.), P. C. Purser, M.C. (A.), H. G. P. Rees (T.), C. B. Ridley, D.S.C. (A.), A. Roberts (T.), E. P. Roberts, M.C., D.C.M. (A.), A. Roulstone, M.C. (A.), H. P. Rushforth, M.C. (A.), L. C. Shoppee, D.S.C. (A. and S.), E. W. Simpson (S.O.), A. C. Snow (T.), R. L. Stevenson, M.B.E. (A.), D. Stewart, A.F.C. (A.), T. Q. Stud, D.F.C. (A.), T. W. Tattersall, M.B.E. (T.), M. Thomas, A.F.C. (A.), T. F. W. Thompson (A.), E. F. Turner (T.), G. H. Walker (A.), W. H. De W. Waller, A.F.C. (A.), D. E. Ward (T.), G. F. P. Warren (T.), L. Whitworth, A.F.C. (A'ship), H. E. P. Wigglesworth, D.S.C. (A.), F. T. Williams, M.B.E. (A.), E. A. E. Wood (T.), W. P. Woodcock (T.), R. A. Young (Ad.).

Flying Officers (from Flight Lieutenants).—F. J. W. Mellersh, A.F.C. (A.), G. A. H. Piccock (A.), J. W. Pinder, D.F.C. (A.), W. W. Wakefield (A.).

Flying Officers.—P. E. D. Addis (Ad.), B. C. Akehurst (T.), A. F. Alexander (A.), C. T. Anderson, D.F.C. (A.), M. H. Armstrong (T.), G. Baillie (T.), A. C. Bayley (A.), W. Bentley, D.F.C. (A.), H. C. Black (A.), G. N. Blennerhassett, M.C. (A.), G. H. Boyce (A. and S.), T. Brewin (A.), R. F. Browne, D.F.C. (A.), G. M. Bryer, A.F.C. (A.), J. Burden (T.), V. W. Burgess, A.F.C. (A.), F. O. Burnley (T.), W. J. Burr, M.C., D.C.M., M.M. (A.), M. H. Butler, D.F.C. (A.), S. L. Cannon (A.), R. L. Cattle (T.), D. V. Carnegie, A.F.C. (A. and S.), B. R. Carter (S.), O. E. Carter, M.C. (A.), J. R. Cassidy (T.), T. W. Cave, M.C. (T.), J. S. Chick, M.C. (A.), F. W. Clarke (T.), P. J. Clayton, M.C., D.F.C. (A.), R. Clowes (A.), J. H. Cooper, M.C. (A.), W. R. Cox, M.C., A.F.C. (A.), R. C. Creamer, D.F.C. (A.), P. H. Cummings, D.F.C. (A.), C. C. K. Dagg, A.F.C. (A. and S.), G. D. Daly (T.), A. J. Dawes (Ad.), S. Dawson, D.F.C. (A.), M. C. Dick (A.), H. H. Down, A.F.C. (A.), G. F. Drudge (T.), W. F. Dry (T.), D. L. Evans, M.C., D.F.C. (A.), N. Fitzgerald Eager (A.), S. S. Flock, D.F.C. (A.), A. H. Flower (A.), G. J. Fowler, A.F.C. (A.), G. Fox-Rule, D.F.C. (A.), C. S. Fulton (S.O.), A. V. Gash (Ad.), J. M. Glaisher, D.F.C. (A.), S. Graham, M.C., A.F.C. (A.), E. G. Green, M.C. (A.), L. W. R. Grubb (A.), W. Halford, D.F.C. (A.), R. Hall (T.), J. H. Halliwell (A.), W. Halliwell (Ad.), L. Hamilton, D.F.C. (A.), W. F. Hamilton (A.), H. N. Hampton, D.F.C. (A.), P. Harris (A. and S.), L. G. Harrison (A.), R. Harrison, D.F.C. (A.), J. R. R. Harvey, M.M. (A. and S.), G. H. Havelock-Sutton, M.C. (Ad.), G. S. L. Hayward, M.C. (A.), A. E. Hempel (A.), V. F. R. Hill (T.), G. S. Hodson, A.F.C. (A.), H. L. Holland (A.), R. Hood (A.), G. V. Howard, D.F.C. (A.), G. N. Humphreys (A.), N. W. Hustings (A.), J. W. Hustwaite (Ad.), R. M. Johnson (A. and S.), A. L. Jones (A.), B. C. Jones (A.), O. J. F. Jones-Lloyd (A.), G. Kidd (A. and S.), A. G. Lamplugh (A.), R. H. Latham (T.), A. Leach, M.C. (A.), E. M. Ling (T.), L. J. Lipscomb (T.), H. G. W. Lock (A.), L. W. Lowen (A.), H. T. Lydford, A.F.C. (A.), E. P. Mackay (A.), I. C. R. Mackenzie (A.), J. M. McEntegart (S.O.), J. McFarlane, M.C. (A.), E. C. McKenzie-Martin (T.), J. A. McLaren, M.C. (Ad.), E. J. McLoughlin (A.), F. McQuistan, D.F.C. (A.), P. M. McSwiny (A.), G. H.

Martingell, A.F.C. (A.), W. K. Mercer (A.), G. F. Moody (A. and S.), G. A. Morgan, A.F.C. (A.), C. P. Murchie (T.), W. G. Murray (T.), C. E. Nightingale (T.), M. J. Norton (Ad.), A. J. Packham (T.), L. H. Pakenham-Walsh D.F.C. (A.), M. T. S. Papenfus, D.F.C. (A.), L. F. Peaty (T.), L. F. Pendred, D.F.C. (A.), C. Pilkington, A.F.C. (A.), S. L. G. Pope (A. and S.), W. G. Preston, D.F.C. (A.), S. L. Quene, M.C. (A.), R. J. Read (A.), A. R. M. Rickards (A.), H. N. C. Robinson, M.C. (A.), R. C. Rodger, M.C., D.C.M. (A.), F. H. Rowan (T.), H. St. C. Roy, M.C. (T.), G. Scarrott (Ad.), H. E. Searson, D.F.C. (A.), F. H. Shales (A.), T. MacM. Shields, D.F.C. (A.), W. Sidebottom, D.F.C. (A.), F. H. Sims (Ad.), W. M. Smith (A. and S.), C. B. S. Spackman, D.F.C. (A.), D. A. Stewart, M.C., D.F.C. (A.), J. S. Stubbs, D.F.C., A.F.C. (A.), S. Symonds (T.), A. R. Thompson (T.), A. C. Townsend, A.F.C. (A.), W. E. Townsend (T.), E. E. Turner, D.F.C., D.S.C. (A.), R. H. Tweedy (T.), E. A. B. Urmston (A.), E. C. Usher (A. and S.), G. O. Venn (A.), T. V. Villiers (T.), L. E. Vine (T.), A. W. S. Wagner (Ad.), H. de W. Waller (A.), J. W. Wallwork, M.C. (A.), E. A. M. Waterton (A.), F. N. Whiteley (A.), G. W. M. Whitton (T.), C. G. Wigglesworth, A.F.C. (A'ship), T. M. Williams, M.C., D.F.C. (A.), H. E. Winch (A.), A. E. Woodbridge (A.), E. C. B. Wright (A. and S.), S. G. Wybrow (T.), W. M. Yool (A.), H. N. Young, D.F.C. (A.), E. L. Zink (A.).

Observer Officers.—P. J. Bradley, C. P. M. B. Caillard, P. A. Cockeram, M.C., E. J. Garner, A.F.C., O. R. Gayford, D.F.C., R. Hamilton, M.C., A. J. Insall, N. H. Jenkins, D.F.C., D.S.M., H. Smith, D.F.C., A. C. Stevens, J. C. Tulock, W. S. Watson.

Flying Officers (from Pilot Officers).—A. J. Adams (T.), F. Adams (T.), L. W. Allen, M.C. (T.), W. Allen (T.), A. T. J. Anderson (A. and S.), W. Baginall (T.), A. A. W. Barron (T.), E. A. J. Brown (A.), B. G. Bryan (T.), A. C. S. Buist, M.C. (A.), S. D. Carpenter (T.), A. E. Case (T.), P. Christopherson (T.), C. C. Clark (T.), E. H. Colman (A.), F. H. Davis (T.), H. H. French (Ad.), W. Frederick (T.), W. H. Golder, D.S.M. (T.), K. C. L. Gorringer (A.), G. A. Gowler (A.), G. R. St. C. Gwynne-Timothy (A.), O. T. Hazell (A.), B. E. Herbert, D.C.M. (A. and S.), S. Herbert (T.), J. F. Herd (T.), O. A. P. Heron, D.F.C. (A.), W. E. Humphreys (T.), J. H. Huxley, D.F.C. (A.), J. D. Jackson (A.), P. J. R. King (A.), F. Kirk (A.), G. Lacey (T.), W. E. Lowrie (T.), F. J. Magee (T.), E. Marsden (T.), M. H. McErlan (A.), R. C. Michaelson (A. and S.), J. W. Mitchell (T.), L. G. Morris (T.), F. C. North (T.), F. A. O'Brien (T.), E. S. Osborn (T.), J. Owen, D.F.C., M.M. (A.), G. T. H. Pack (T.), L. A. Parker (T.), S. H. Potter (A.), C. Roper (S.), J. Sewell (T.), I. C. Slater (A.), J. H. Slater, M.B.E. (T.), H. A. Smith (T.), G. R. B. Smyth (A.), F. R. Steggall, D.C.M. (A.), H. H. Storrs (A.), F. J. Tadmam, C.G.M. (T.), A. J. H. Taylor (A.), E. Taylor (T.), R. M. Thomas (T.), S. Upton (T.), H. Webb (T.), F. H. Whitmore, D.S.C. (T.), H. B. Williams (A.).

Observer Officers (from Pilot Officers).—A. W. Bloy, H. J. Collins, W. C. Day, M.C., J. H. Gray, T. P. T. Jones, B. J. Paget, F. Thomasson, D.F.C., M.M., G. I. Thomson, D.F.C.

The classification of Flight Lieut. G. W. Roberts, M.C. (S.O.) is as now described, not (A.) as stated in the *Gazette* of Oct. 10.

The second Christian name of Flying Officer Rupert Chandos Bryant (A.) is as now described, not "Charles," as stated in the *Gazette* of Sept. 12.

The notifications appearing in *Gazettes* of the dates indicated below, appointing the following officers to short service commns., are cancelled:—Flying Officer F. L. Barnard (A.), Flying Officer A. Grimshaw (A.), Flying Officer P. D. Robins (A.), Observer Officer J. C. Wallace; Sept. 12. Flight Lieut. J. H. D. M. Campbell (S.O.); Oct. 10.

The following officers are granted short service commns., with effect from Aug. 1, not Oct. 10, as stated in *Gazette* of the latter date:—Flight Lieut. H. Cooch, A.M.I.E.E. (T.), Flight Lieut. E. L. Johnstone, A.F.C. (A'ship) Flight Lieut. A. J. Osborn (S.O.).

London Gazette, October 28.

Permanent Commissions.

The attention of officers named in this *Gazette* is directed to Air Ministry Weekly Order No. 866 of 1919, relating to the grant of permanent commns. and to the new rates and conditions of pay and other emoluments.

The following are granted permanent commns. in the R.A.F. in the ranks stated with effect from Aug. 1:—

Squadron Leaders.—P. A. Shepherd (S.), G. F. H. Faithfull, O.B.E. (S.), M. E. A. Wright, A.P. (T.), J. C. M. Lowe, A.P. (T.).

Flight Lieutenants.—C. J. McKay, M.C., D.F.C. (A.), J. Pearce, O.B.E. (T.), H. K. Thorold, D.S.C., A.F.C. (A.), A. Coningham, D.S.O., M.C., D.F.C. (A.), N. C. Spratt (A.), J. O. Andrews, D.S.O., M.C. (A.), A. Lees (A.), D. O. Mulholland, A.F.C. (A.), W. A. C. Morgan, M.C. (A.), F. H. M. Maynard, A.F.C. (A.), B. G. A. Baker, M.C. (A.), E. J. D. Routh (A.), R. H. M. S. Saundby, M.C., A.F.C. (A.), J. K. Summers, M.C. (A.), N. B. Fuller, M.B.E. (A.), M. R. N. Jennings, M.C., A.F.C. (A.), G. E. Godsave (T.), R. S. Aitken, M.C., A.F.C. (A.), J. A. Slater, M.C., D.F.C. (A.), R. W. Chappel, M.C. (A.), J. F. A. Day, A.F.C. (A.), J. B. Walmesley, D.F.C. (A.), R. G. E. Fulljames, M.C. (A.), N. Keeble, D.S.C. (A.), W. D. Thom, D.F.C. (A.), F. St. J. Woollard, A.F.C. (A.), A. H. Orlebar (A.), A. B. Shearer (A.), H. W. Evans (S.), L. M. Bailey, A.F.C. (A.), L. O. Brown, D.S.C., A.F.C. (A. and S.), P. D. Robertson, A.M. (T.), A. R. Mackenzie, A.P. (T.), D. S. Don (A.), C. K. Chandler, M.B.E. (T.), G. W. Biles, D.F.C. (A. and S.), V. R. Scriven, A.F.C. (S.), W. S. Magrath (A.), P. E. Gwyer, M.B.E. (T.), D. Colyer, D.F.C. (A.), M. A. J. Orde (T.).

Flying and Observer Officers.—H. M. Massey, M.C. (S.O.), C. O. B. Beale, D.S.O. (A.), C. A. Stevens, M.C. (A. and S.), C. R. Steele, D.F.C. (A.), W. A. K. Daizell (A.), S. M. Kinhead, D.S.C., D.F.C. (A.), P. H. Mackworth, D.F.C. (A. and S.), W. H. Park, M.C., D.F.C. (A.), A. L. Chick, A.F.C. (A.), C. T. Black (A.), E. R. C. Scholefield, D.C.M., (A.), F. Williams, M.C., D.F.C. (A.), I. Cullen, A.F.C. (A.), E. W. Broadberry, M.C. (A.), N. S. Dougall, D.F.C. (O.), A. M. Wray, M.C., A.F.C. (A.), E. E. F. Loyd (A.), J. W. Mullen (O.), W. Sharpe, A.F.C. (A.), I. H. P. McEwen (A.), H. S. P. Walmsley, M.C. (A.), C. H. Arnison, M.C. (A.), H. E. Walker, M.C., D.F.C. (A.), G. C. O'Donnell, D.F.C. (A.), H. L. Rough, D.F.C. (A.), H. H. Sharp (T.), J. J. L. Williams, M.C. (A.), C. L. King, M.C., D.F.C. (A.), T. S. Horry, D.F.C. (A.), C. H. H. Binley (A. and S.), G. A. Pennington (A. and S.), J. L. Findlay, M.C. (A.), S. T. B. Cripps (A.), E. B. Jones (A.), J. R. F. Randall, D.F.C. (A.), G. Y. Tyrrell, M.C. (A.), J. W. Turton-Jones (O.), W. H. Poole, A.F.C., M.M. (A.), C. Rapley (T.), F. G. Brockman (T.), H. Nelson (T.), F. G. Porter (O.), P. J. Parry (A.).

Captain.—E. C. Emmett, M.C., D.F.C. (A.).

The notification appearing in *Gazette*, Sept. 16, appointing Flying Officer P. H. Mackworth, D.F.C. to a shortservice commn., is cancelled.

The following temp. appointments are made at the Air Ministry:—

Staff Officer, 1st Class (Medical).—Wing Com. H. Cooper, D.S.O.; Sept. 6.

Staff Officers, 2nd Class (Medical).—Flight Lieut. (actg. Sqdn. Leader) J. A. Giles, Flight Lieut. (actg. Sqdn. Leader) H. A. Treadgold; Sept. 6.

Flying Branch.

Sec. Lieuts. to be Lieuts.—L. Radford; Sept. 15, 1918. T. Q. Harvey, G. G. Ross-Smith; Nov. 2. F. H. Solomon; Jan. 29. J. R. McL. Keil; May 17.

Sec. Lieut. R. Boyle to be Sec. Lieut. (O.), from (Ad.); May 27, 1918.

6564 Flight Cadet C. Goatcher is granted a temp. commn. as Sec. Lieut. (O.); Sept. 9, 1918.

Flight Cadet G. A. Vincent is granted a temp. commn. as Sec. Lieut. (A. and S.); Nov. 8, 1918.

The following Flight Cadets are granted temp. commns. as Sec. Lieuts. (O.):—175516 A. S. Farquhar, 173527 W. Porter; Oct. 20, 1918 (substituted

for the notification in the *Gazette* of Feb. 14, wherein the above Cadets were appointed, with effect from Oct. 25, 1918).

The following relinquish their commns. on ceasing to be employed:—Sec. Lieut. H. D. Giblett; May 19. Lieut. W. R. McCoo; July 18 (substituted for notification in the *Gazette* of June 3). Lieut. W. A. Peggs (Lieut., Sherwood For.); July 24. Sec. Lieut. (Hon. Lieut.) H. B. Kennedy (Lieut., Can. Field Art.); Aug. 1. Lieut. (Hon. Capt.) C. O. Lilly, D.S.O. (Capt., Dorset R.); Aug. 28. Lieut. P. J. Long (Capt., R.A.S.C.); Sept. 1. Lieut. G. D. A. Heys (Lieut., R.G.A.); Sept. 19. Capt. A. D. Gaye (Capt., Hereford R.); Sept. 20. Lieut. (Hon. Capt.) P. A. Smith (Capt., Dur. L.I.); Sept. 22. Sec. Lieut. F. Haveland (Lieut., R.G.A.); Oct. 9. Lieut.-Col. G. F. Montague (Com. R.N.); Oct. 12. Lieut. (Hon. Capt.) R. S. B. Beckett (Capt., Gurkha Rif.); Oct. 13. Lieut. H. R. Eycott-Martin, M.C. (Lieut., R.E.), Lieut. S. G. Glover, D.C.M. (Lieut., R. Ir. Fus.); Oct. 14. Lieut. A. W. Hawkins (Lieut., Yorks R.); Oct. 17. Sec. Lieut. B. Bear, M.M. (Lieut., E. Yorks R.); Oct. 18. Lieut. H. V. Sanderson (Lieut., R.F.A.); Oct. 20. Sec. Lieut. (Hon. Lieut.) A. J. R. Napier (Lieut., Ches. R.); Lieut. T. H. J. Wright (Lieut., Seaf. Highrs.); Oct. 21. Sec. Lieut. (Hon. Lieut.) G. E. Clavey (Lieut., R.F.A.); Oct. 24.

(Then follow the names of 172 officers who are transfd. to the Unemployed List under various dates.)

Lieut. (actg. Capt.) L. J. Mann, M.C. (Lieut., R.A.S.C.), relinquishes his commn. on account of ill-health, and is permitted to retain the rank of Capt.; Feb. 8 (substituted for notification in the *Gazette* of Feb. 7).

Lieut. A. C. E. Gregory relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; Oct. 18.

Lieut. W. J. H. Courts (Lieut., Devon R.) resigns his commn.; Oct. 24.

Sec. Lieut. H. P. Brummell relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain his rank; July 12 (substituted for notification in the *Gazette* of Sept. 30).

Sec. Lieut. (Hon. Lieut.) C. C. Loretto is antedated in his appointment as Sec. Lieut. (Hon. Lieut.) (O.); Aug. 8, 1918.

The initials of Lieut. L. A. Tapper are as now described, and not "L. J. A.," as stated in the *Gazette* of Sept. 5.

The notification in the *Gazette* of Oct. 10 concerning P. F. O. A. J. Mantie, D.F.C., is cancelled.

The notification in the *Gazette* of April 29 concerning Sec. Lieut. F. H. Snoxell is cancelled. (*Gazette* notice of May 30 to stand.)

The notification in the *Gazette* of May 2 concerning Sec. Lieut. S. Pile is cancelled.

The notification in the *Gazette* of July 18 concerning Sec. Lieut. N. Sillars is cancelled.

The notification in the *Gazette* of Aug. 12 concerning Sec. Lieut. (Hon. Lieut.) H. B. Kennedy, is cancelled.

The notification in the *Gazette* of Sept. 5 concerning Lieut. S. Hill is cancelled.

The notification in the *Gazette* of Sept. 16 concerning Lieut. A. McD. Dunlop is cancelled.

The notification in the *Gazette* of Oct. 3 concerning Lieut. C. H. Archer is cancelled.

The notification in the *Gazette* of Oct. 15, 1918, concerning Flight Cadet R. S. Nicholl is cancelled.

The notification in the *Gazette* of May 21, 1918, concerning Sec. Lieut. E. H. Bullen is cancelled.

The notification in the *Gazette* of June 24 concerning Lieut. E. L. Sutcliffe is cancelled.

The notification in the *Gazette* of Oct. 17 concerning Sec. Lieut. W. W. Smith, is cancelled.

Administrative Branch.

Sec. Lieut. T. F. T. M. Williams to be Lieut.; June 13.

(Then follow the names of 33 officers who are transfd. to the Unemployed List under various dates.)

Lieut. D. H. Rudd relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; Oct. 2.

Sec. Lieut. F. Nicholls relinquishes his commn. on account of ill-health; May 20 (substituted for notification in *Gazette* of Jan. 31).

The following Sec. Lieuts. relinquish their commns. on account of ill-health, and are permitted to retain their rank:—I. C. Bannister; July 1 (substituted for notification in *Gazette* of July 1). G. B. Blake (contracted on active service); Sept. 28.

The surname of Flight Lieut. F. F. Loyd is as now described, and not as "Lloyd," as stated in *Gazette* of Sept. 26.

The notification in *Gazette* of Sept. 19 concerning Sec. Lieut. G. B. Blake is cancelled.

Technical Branch.

Pilot Officers to be Flying Officers, without the pay and allowances of that rank:—H. E. Davies, F. W. Todd; Oct. 1.

Lieut. C. L. Cleburne (Lieut., Hampshire Aircraft Park, T.F.), relinquishes his commn. on ceasing to be employed; March 9.

(Then follow the names of 59 officers who are transfd. to the Unemployed List under various dates.)

Lieut. E. A. B. Carter (Midd'x R., T.F.), relinquishes his commn. on account of ill-health (contracted on active service), and is granted the rank of Capt.; Jan. 25 (substituted for notification in the *Gazette* of Jan. 24).

The initials of Lieut. R. J. Murchison are as now described and not "R. T." as shown in *Gazette* of Sept. 30.

Medical Branch.

(One officer transfd. to the Unemployed List.)

Memoranda.

(Then follow the names of 2 Overseas Cadets granted temp. commns. as Sec. Lieuts.)

The following temp. Hon. Lieuts. relinquish their commns. on ceasing to be employed:—J. A. Foster; Sept. 2. G. G. Bradshaw, H. R. Fulford; Sept. 16. E. Johnson, C. F. Woodgate; Oct. 16. T. Kimpton; Oct. 18.

Lieut. (actg. Capt.) W. J. C. Kendall, M.C., is transfd. to Unemployed List, from (S.O.); Oct. 9.

Lieut.-Col. C. F. de S. Murphy, D.S.O., M.C. (Maj., R. Berks. R.) resigns his commn., and is granted the hon. rank of Brig.-Gen.; Sept. 17 (substituted for notification in the *Gazette* of Sept. 16).

Capt. (actg. Maj.) W. T. Blake (Oxon and Bucks L.I.) relinquishes his commn. on account of ill-health, and is granted the rank of Maj.; May 13 (substituted for notification in the *Gazette* of May 27).

London Gazette, October 31.

The following promotions are made:—

Air Commodores.—Group Capt. H. R. M. Brook-Popham, C.B., C.M.G., D.S.O., A.F.C.; Group Capt. E. M. Maitland, C.M.G., D.S.O., A.F.C.; Aug. 4.

Air Commodore.—A. V. Vyvyan, C.B., D.S.O., to be Air Vice-Marshal; Oct. 10.

Air Commodores.—Group Capt. (actg. Air Commodore) B. H. H. Cooke, C.M.G., C.B.E., D.S.O., relinquishes the grading for pay and allowances as Air Vice-Marshal; Oct. 18.

Flying Branch.

Lieut.-Col. C. F. de S. Murphy, D.S.O., M.C., to be Lieut.-Col. (A.), from Group Commander; June 5.

Flight-Lieut. H. A. Tweedie to be Flight-Lieut. (A. and S.), from (S.O.); Sept. 15.



Lieut. C. G. Ferrell is graded for purposes of pay and allowances as Capt. whilst employed as Capt. (A. and S.); June 21.

Lieut. I. L. Roy to be Lieut. (A.), from (T.); June 1, 1918.

Sec. Lieuts. to be Lieuts.:—J. H. Manicom, M.C.; Nov. 30, 1918 (since demobilised). W. C. Treen, M.C., D.F.C.; April 1 (since relinquished commn.).

Pilot Officers to be Flying Officers:—W. Smith; Oct. 1. W. G. Freel; Oct. 24.

P.F.O., C. E. Usher-Somers (late R.N.S.A.) is granted a temp. commn. as Sec. Lieut. (A.); Aug. 14, 1918. 305019 Flight-Cadet A. Wilson is granted a temp. commn. as Sec. Lieut. (O.); Aug. 26, 1918.

The following relinquish their commns. on ceasing to be employed:—Lieut. S. C. P. Slattery (Lieut., Ox. and Bucks. L.I.); Sept. 11. Sec. Lieut. J. L. Fletcher (Sec. Lieut., Dorset R.); Oct. 13. Lieut. H. Kirby (Lieut., E. Kent R.); Oct. 15. Lieut.-Col. A. C. E. Marsh (Maj., R.F.A.), Capt. C. C. Waddington (Capt., Hamp. R.), Lieut. (Hon. Capt.) T. R. Wells, M.C. (Capt., Punjabis); Oct. 16. Maj. R. G. H. Murray, M.C. (Maj., Gurkha Rifls.); Oct. 21. Capt. R. H. Shears (Capt., Shrops. L.I.), Lieut. C. E. Jessell (Lieut., Wilts. R.); Oct. 22. Maj. J. E. Hume, D.S.O. (Capt., Conn. Rangs.); Oct. 23. Lieut. E. P. Manson, M.C. (Lieut., Midd'x. R.); Oct. 25.

(Then follow the names of 132 officers who are transfd. to the Unemployed List under various dates.)

The following Capts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank:—D. G. Young; Oct. 24. J. M. Heap; Oct. 27.

Capt. H. Hemming, A.F.C. (Lieut., Worc. R.), resigns his commn.; Nov. 1. Lieut. D. E. P. Chaplin (Lieut., R.H., R.F.A.), resigns his commn.; Sept. 10 (substituted for notification in *Gazette* of Sept. 9).

Lieut. O. C. Holleran relinquishes his commn. on account of ill-health caused by wounds, and is granted the rank of Capt.; Sept. 26.

Lieut. J. C. Wilson, D.F.C., relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; Oct. 23.

Sec. Lieut. F. B. A. Punnett relinquishes his commn. on account of ill-health contracted on active service, and is permitted to retain his rank; Sept. 28.

Sec. Lieut. (Hon. Lieut.) C. J. Swatridge (Lieut., Notts. and Derby. R.), resigns his commn.; Oct. 25.

The initials and rank of Lieut. W. E. B. Holland are as now described, and not "Lieut. (actg. Capt.) W. E. Holland," as stated in *Gazette* of May 6.

The notification in *Gazette* of April 1, concerning Sec. Lieut. (Hon. Lieut.) G. J. Williams, is cancelled (notification in *Gazette* of April 4 to stand).

The notification in *Gazette* of April 8, concerning Lieut. W. J. Goddard, is cancelled.

The notification in *Gazette* of June 6, concerning Sec. Lieut. R. J. Palmer, is cancelled (notification in *Gazette* of Aug. 29 to stand).

The notification in *Gazette* of July 29, concerning Lieut. W. Adamson, is cancelled.

Administrative Branch

Wing Com. A. C. H. MacLean to be Wing Com., from (S.O.); Oct. 7.

Lieut. J. B. V. Clements, D.F.C., to be Lieut., from (O.); Nov. 23, 1918 (substituted for notification in *Gazette* of Feb. 4).

Sec. Lieut. I. Holliday to be Lieut. (since demobilised); May 8.

Pilot Officer (Hon. Flying Officer) L. Miller to be Pilot Officer (Hon. Flying Officer), from (S.O.); Sept. 24.

(Then follow the names of 42 officers who are transfd. to the Unemployed List under various dates.)

Capt. (actg. Maj.) W. J. King (R. Muns. Fus.) relinquishes his commn. on account of ill-health (caused by wounds); May 16.

Capt. P. G. Pullon (Ches. R., T.F.) relinquishes his commn. on account of ill-health caused by wounds, and is permitted to retain his rank; Oct. 20.

Sec. Lieut. T. Collins relinquishes his commn. on account of ill-health, and is permitted to retain his rank; Oct. 23.

The initials of Lieut. F. W. Alderton are as now described, and not "W. F." as stated in *Gazette* of Feb. 14.

The notification in *Gazette* of Oct. 3 concerning Lieut. J. R. M. Tweddell, is cancelled (*Gazette* of July 29 to stand).

Technical Branch

Lieut. M. P. Mullery to be actg. Capt. whilst employed as Capt., Grade (A.); from Aug. 28, 1918, to April 30.

The following Lieuts. are graded for purposes of pay and allowances as Capts. whilst employed as Capt., Grade (A):—

M. P. Mullery; from May 1 to May 15.

H. A. Adams, from (S.O.); May 13 (substituted for notification in the *Gazette* of May 30 and July 15).

Lieut. I. L. Roy to be Lieut., Grade (B), from (A); April 4, 1918 (substituted for notification in the *Gazette* of May 7, 1918).

Lieut. F. C. Rayson to be Lieut., Grade (B), from A'ship; July 17 (substituted for notification in the *Gazette* of Sept. 5).

Sec. Lieuts. to be Lieuts.:—P. S. Riach; April 15, 1918 (without pay and allowances of that rank prior to May 1, 1918). C. C. Parrott; Jan. 29 (without pay and allowances of that rank prior to March 13) (substituted for notification in the *Gazette* of April 4). Sec. Lieut. (Hon. Lieut.) C. J. Poole is graded for purposes of pay and allowances as Lieut. whilst employed as Lieut., Grade (B), from May 1 to July 31.

Sec. Lieuts. to be Lieuts. without the pay and allowances of that rank:—J. Butcher, G. G. Hargrave; April 2, 1918.

Sec. Lieut. S. Graves to be Sec. Lieut., Grade (B), from (Ad.); June 7.

(Then follow the names of 59 officers who are transfd. to the Unemployed List under various dates.)

Capt. H. Lancaster (Norf. R.) relinquishes his commn. on account of ill-health; Oct. 20.

The notification in *Gazette* of April 29 concerning Sec. Lieut. (Hon. Lieut.) R. W. V. Midlane, is cancelled.

The notification in *Gazette* of June 3 concerning Sec. Lieut. (Hon. Lieut.) R. W. V. Midland, is cancelled.

The notification in *Gazette* of May 30 concerning Sec. Lieut. G. R. Wills, is cancelled.

Medical Branch

(4 officers transfd. to the Unemployed List.)

Memoranda

The following temp. Hon. Lieuts. relinquish their commns. on ceasing to be employed:—J. B. Mitchell, R. K. Roberts, J. P. Tweedy; Sept. 16. E. D. Burley, H. E. Portsmouth, H. E. G. Rowley, R. G. Sharp; Oct. 16.

(9 officers transfd. to the Unemployed List.)

Sec. Lieut. G. P. Pinney relinquishes his commn. on account of ill-health, and is permitted to retain his rank; Oct. 8.

The notification in the *Gazette* of Oct. 10 concerning Temp. Hon. Lieut. (Hon. Capt.) W. S. Kellar, is cancelled.



VARNISHES FOR AIRCRAFT WORK

THE selection of a varnish for use on aeroplanes is not an easy matter, for the conditions under which it is called upon to do its work are onerous, to say the least, while it is all too seldom that it is possible to give the time necessary to ensure the coating being thoroughly dry, so that it may give its maximum efficiency. It is, therefore, with pride that Llewellyn Ryland, Ltd., look back to 1916, when their Ryland varnish was adopted by the Air Ministry for use on the doped fabric of aeroplanes as being the most suitable for the purpose. So satisfactory did it prove that in order to meet the demands of the Service it became necessary not only to concentrate all the energies of the works at Balsall Heath, Birmingham, upon its production, but also to greatly increase the plant for its manufacture, and in 1918 over 100,000 gallons were supplied to the Air Ministry.

Among the characteristics of Ryland varnish which render it specially adapted for aero work, may be mentioned the fact that it dries rapidly—in from five to six hours—forming a thin film, which weighs less than 1 oz. to the square yard. This film is highly elastic, and yet is very hard and durable; it resists the action of a mixture of hot castor and mineral oil, is especially impermeable to moisture, and withstands the action of petrol, while it protects metal, wood or aero fabric with equal reliability. For years before the manufacture of Ryland varnish was commenced on a large scale in 1913, the firm had conducted experiments in various climates and situations all over the world. Even now, in spite of the

success which has been attained, the firm is continuing its research and experimental work in a persistent endeavour to improve the qualities of the varnish, and to ensure that it is the best material for its purpose in aviation work.

For use on propellers, Messrs. Llewellyn Ryland have devised a scheme of varnishing, and the method of applying its coat together with its subsequent treatment are dealt with in a pamphlet of which they will gladly send copies to anyone really interested.

The firm has had an unique experience in the preparation of protective coverings. How far the record goes back it is not possible to ascertain precisely, but it is definitely known to have originated, over a century ago, with ancestors of the present proprietors and the family succession in the control of its affairs has been uninterruptedly maintained. In 1898, a limited liability company was formed, under the style of Llewellyn Ryland, Ltd., of which Mr. J. W. Ryland and Capt. L. M. Ryland are the directors, Mr. J. W. Ryland being the chairman and managing director.

Prior to the War, the company was mainly engaged in the export of varnishes for railways, coach and motor body builders, decorators, etc., and lacquer for the brass trade, to North and South America, South Africa and Australia. They have a branch company in Chicago, and offices and agents in Rio de Janeiro, Cape Town, Sydney, Oporto, Lisbon, Bilbao, Brussels, and Bombay, while agents have recently been appointed in the Near East, Poland, Scandinavia, Mexico, etc.

SIDE-WINDS

IN order to put the business of Lodge sparking-plugs on a basis rendered necessary by its present scope, and to allow for factory developments to meet the world-wide demand for Lodge plugs, a new company is being formed (and will be registered on November 19, 1919) with a capital of £300,000, to take over and carry on the business of the Lodge Sparking-Plug Co., Ltd. Opportunity will be taken of this reconstruction to shorten the name of the company, which will in future be known simply as "Lodge Plugs, Ltd." There will be no change in either its ownership, management or general policy, and the quality of the Lodge plugs will be

maintained at their traditional high level. They will continue to be produced in the same up-to-date and extensive factory near Rugby.

THE Airco service has, with Saturday's scheduled flights, completed its tenth week of daily operation, and the record of the service now stands as follows:—Flights scheduled, 154; flights accomplished, 147; prevented by weather, 1; interrupted by weather, 3; interrupted by mechanical defects, 3; number of miles flown, 37,750; average speed (miles per hour), 105; The following is a summary from

official reports of the weather flown through during these ten weeks:—Days favourable for flying, 17; days unfavourable, 30; days noted officially as "unfit" for flying, 13.

DURING the week ending October 29, 1919, the Handley Page London-Paris service carried 38 passengers and 2,172 lbs. of freight. The London-Paris flights were carried out to scheduled time, despite high winds, rain and fog. During the same period 21 passengers were carried on the London-Brussels service, and 630 lbs. of luggage. Freight had to be refused, owing to the present restrictions preventing merchandise from being carried by air to Belgium. On October 28, two ladies, aged respectively 75 and 73, were flown from London to Brussels during a gale.

A HANDLEY PAGE is to be exhibited at the sixth International Aircraft Exhibition which will open at the Grand Palais, Paris, on December 19.

THE four-engined Handley Page machine, which was exhibited at the E.L.T.A. Exhibition, Amsterdam, returned by air on October 30, and landed at Hounslow. When the machine left the aerodrome in Holland, the locality was in so flooded a condition that sea-gulls were floating on the water in the vicinity of the machine. Passengers were carried and their bicycles were stored in the machine to enable the owners to return by road from Vrieswick, where a landing was made. The final stage of the journey was a non-stop flight to Hounslow in two and a half hours.

CAPT. HINCHCLIFFE and Mr. Shanks are still over in Holland with their Avros, but the weather has been too bad of late to permit of much flying. In the intervals, Capt. Hinchcliffe finds occupation and amusement in negotiations with the Customs authorities over the valuation of material. The duels on this question are fierce and furious. The officials' estimate of value is usually about one million guilders. The Avro pilot replies with a valuation of about 9d. Then begins the battle, and they fight it out inch by inch, or rather guilder by guilder, until eventually they arrive at a figure considered fair by both sides. Then an armistice is signed until fresh goods arrive from England. They are still using the E.L.T.A. aerodrome, which is now a most deserted place, overshadowed by the presence of Herr Fokker, who has purchased all the exhibition buildings and the fencing surrounding the aerodrome. The rivalry of commercial aeroplanes seems to be no less keen than were the contests of the War. Well, the British won the first event and they have no cause to be doubtful about the result of the sequel, if merit counts for anything.

COMPANY MATTERS

British Internal Combustion Engines, Ltd.

PRESIDING at the first annual general meeting of the above company, Mr. R. Henry Wheeler, said:—

"I would remind you that the company was only registered in April, 1918, and I think you will agree that it has already given a very good account of itself. As the company pays the income-tax up to 5s. in the £ on the dividends, they are equivalent to £9 7s. 6d. per cent. on the preference, and £6 5s. per cent. on the ordinary shares.

"As you are aware, the Green Engine Co., Ltd., is the proprietor of the British, Foreign and Colonial patents under which the Green engine is designed and manufactured. This engine was famous as the winner of the Naval and Military Aeroplane Engine Competition, winning the first prize of £5,000 for the best aeroplane engine immediately prior to the War, and it is very significant that in the first race after the War its 35 h.p. engine beat all competitors in the Aerial Derby Handicap at Hendon in Messrs. A. V. Roe and Co.'s new 'Baby Avro' aeroplane. As a result of its recent remarkable performances, many inquiries have been received and some very satisfactory business has already been concluded, justifying the forecast made at our statutory meeting that the Green engine would again take a foremost place in the great future of aircraft of all kinds for Naval, Military and commercial purposes. These engines are now standardised in five sizes, viz., 35, 100, 160, 275 and 450 h.p., and, in addition, an engine of 1,000 h.p. is in course of completion. You will be pleased to know that Green engines were fitted into many of the submarine chaser coastal motor-boats for the Admiralty, and proved a great success in the Zeebrugge and Ostend raids. Mr. G. Green, the designer of these engines, is a successful inventor who is always at work exclusively in our interests, and he may well be proud of the results obtained. Further developments are pending in connection with Green engines which should prove to be a source of considerable additional profit to this company.

"The position of the Aster Engineering Co., Ltd., may be judged from the fact that since we became interested its dividend has been doubled. The Aster company's works are being enlarged as rapidly as possible, and additional machinery is being installed. Our associated companies are pioneers in the development of the internal combustion engine for aviation, road transport, and the generation of electricity, and we are, therefore, in a position to take full advantage of the great future before this industry. The energy and foresight of Mr. Sydney D. Begbie and Mr. Fred May, the managing directors of the Aster Engineering Co., Ltd., and the Green Engine Co., Ltd., respectively, are mainly responsible for the present satisfactory position. The enthusiasm and keenness of these gentlemen are reflected in the attitude of their staffs and workmen, with whom they are in constant and direct touch, and the results speak for themselves."

Rolls-Royce, Ltd.

THE directors announce that, after paying or providing for all trade expenses, suitable depreciation of buildings, machinery and plant, and after charging repairs and replacements to revenue and writing down additions thereto to estimated post-War value, the trading for the year to October 31, 1918, resulted in a net profit of £153,262, after making provision for estimated excess profits tax. The dividends for such period have already been paid. The balance-sheet takes no account of the manufactures for War purposes in the United States of America which were financed by the Government.

NEW COMPANY REGISTERED

SAX-WEARS, LTD., George Street Works, George Street, Coventry.—Capital £5,000, in £1 shares (2,500 8 per cent. cumulative preference). Manufacturers of and dealers in tools and accessories for aeromotor and cycle trades, and motor vehicles, etc. Under agreement with F. A. Saxelby and J. H. Wears, trading as "Sax-Wears and Co." First directors: F. A. Saxelby and J. H. Wears.

AERONAUTICAL SPECIFICATIONS PUBLISHED

Abbreviations:—cyl.=cylinder; I.C.=internal combustion; m.=motors

APPLIED FOR IN 1917

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published November 6, 1919

10,597, 10,599, 10,600 and 10,601. A. J. MACY. Controlling and stabilising of aeroplanes. (133,330, 133,331, 133,332 and 133,333.)

APPLIED FOR IN 1918

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

Published November 6, 1919

6,739 and 6,402. E. PRASSONE and L. AVORIO. Kite balloons. (133,348 and 133,349.)
14,622. C. J. LAKE. Controlling and supporting surfaces for aeroplanes. (133,399.)

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages xliii, xlii, xlv, and xlvi).

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